

KEY TO THE VEDAS

Part I

**INTEGRAL
HERMENEUTICS**

**Mikhail I. Mikhailov
& Nathalia S. Mikhailova**

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KEY TO THE VEDAS
PART I.
INTEGRAL HERMENEUTICS

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Contents

PREFACE	8
R. K. SHARMA'S NOTE	9
AUTHOR'S FORWARD	10
TOP VEDIC ENIGMA (INTRODUCTION)	19
1. SCIENTIFIC AND PHILOSOPHICAL SUBSTRUCTURE OF HINDUISM	53
2. VEDAS AS MNEMONIC ANALOGUE-DIGITAL CHRONO-COMPUTER	57
<i>From 'Clock for counting' to a Computer</i>	58
<i>Digital and Analog Computers</i>	60
<i>Vedic computer</i>	62
3. 'THE VITALS OF THE VEDAS' (VEDANGAS) AS CLUES TO PUZZLES OF CHRONOCOMPUTER	65
4. TRADITIONAL MODES OF VEDIC EXEGESIS	68
5. PSEUDO-HISTORICAL (AITIHASIKA) INTERPRETATION	70
<i>The Itihāsas and the Purāṇas</i>	73
<i>Veda-Vyāsa</i>	74
<i>The Bhagavad-Gītā</i>	74
<i>Vālmīki</i>	75
<i>The Birth of Western Indology</i>	75
<i>British colonial Indology</i>	83
<i>Lord Thomas Babbington Macaulay</i>	85
<i>James Stuart Mill</i>	85
<i>Objectionable 'Distant Relatives'</i>	86
<i>Russian Indology</i>	87
<i>Soviet angularity</i>	90
<i>I. D. Serebryakov</i>	93
<i>Indian Revival</i>	94
<i>N. S. Rajaram</i>	95
6. THE VEDIC EMPIRE IN ANTIQUITY	97

<i>Place of Creation of the Rig-Veda</i>	97
<i>Area of the Vedic culture</i>	119
7. PHILOSOPHIC (ADHYATMIKA) INTERPRETATION	139
<i>Leo Tolstoy</i>	142
<i>B. L. Smirnov</i>	147
<i>Nicolay and Helena Roerichs</i>	148
<i>Neo-Hinduism</i>	148
<i>Swami Vivekananda</i>	150
<i>Dayananda Sarasvati</i>	151
<i>Mahatma Gandhi</i>	151
<i>Aurobindo Ghosh</i>	152
<i>Modern Heralds of Hinduism</i>	154
<i>Biological interpretation of the Vedas</i>	154
8. THE VEDIC GLOBAL CHRONOPHILOSOPHY (DARSHANAS)156	
<i>Mīmāṃsā or the Vedic hermeneutics</i>	158
<i>Kumarila-bhatta (VII c.)</i>	160
<i>Prabhakara (VII – VIII c.)</i>	160
<i>Mimansa and programming</i>	160
<i>Vedanta or Cosmic Ethics</i>	162
<i>Schools of Vedānta</i>	163
<i>Brahma-Sutra</i>	165
<i>Upanishadas</i>	166
<i>Yoga-Vasishtha</i>	168
<i>Agamas and Tantras</i>	168
<i>Abhinavagupta (X – XI c.)</i>	169
<i>Kshemendra-Kshemaraja</i>	169
<i>Nyaya</i>	170
<i>Nyāyasūtra</i>	170
<i>Navyanyāya</i>	171
<i>Vaiśeṣika</i>	171
<i>Vaiśeṣika-Sūtra</i>	172
<i>Sāṃkhya</i>	172
<i>Sankhyakarika</i>	173
<i>Kapila</i>	173
<i>Yoga</i>	173
<i>Yogasutra of Patanjali</i>	174
<i>Nastika</i>	175
9. RITUALISTIC (YAJNIKA) INTERPRETATION	178

<i>Protestant assault upon Hinduism</i>	178
<i>William Carey</i>	181
<i>H. H. Wilson (1786-1860)</i>	182
<i>Friedrich Max Muller</i>	182
<i>M. Monier-Williams (1819-1899)</i>	184
<i>Maurice Winternitz (1863-1937)</i>	185
<i>D. N. Ovsyaniko-Kulikovsky</i>	186
<i>T. Y. Elizarenkova</i>	186
<i>Calendar Chronoprogramming (Kalpa vedāᅅga)</i>	187
<i>Primary Sources of the Vedic Etiquette</i>	189
<i>Principles of the Vedic Etiquette</i>	191
<i>Calendar Ceremonies and Memorials</i>	195
<i>Calendar-Astronomical Observatory</i>	200
<i>1130 editions of the Vedas and a 4-year calendar cycle</i>	204
<i>Calendar memorial</i>	206
<i>Calendar memorial and 4-year cycle</i>	210
<i>Calendar bricks and planetary cycles</i>	212
<i>Programming with Mental Bricks</i>	214
10. TRADITIONALISTIC (PHONETIC) INTERPRETATION	215
<i>Phonetics as Phono-Chronometry and Ternary Code (Śikᅅhā Vedāᅅga)</i>	216
11. GRAMMATICAL INTERPRETATION	220
<i>William Jones</i>	220
<i>Indological Squabble</i>	221
<i>Sanskrit as Artificial Programming Language</i>	223
<i>The Programming Language in Computer Science</i>	226
<i>Vedic Linguistical Analytics (Vyākaraᅅa-Vedāᅅga)</i>	228
12. SEMIOTIC-ETYMOLOGICAL INTERPRETATION	232
<i>Astro-Mytho-Etymology (Nirukta-Vedāᅅga)</i>	238
<i>Cryptography</i>	239
<i>The Vedic Hypertext and Chronopoetics</i>	241
13. SCIENTIFIC (PURVAYAJNIKA) INTERPRETATION	252
14. THE VEDIC EXACT SCIENCE	260
15. COSMOLOGICAL INTERPRETATION	266

16. MATHEMATICAL INTERPRETATION	268
<i>Character of Vedic Mathematics</i>	268
<i>Vedic Standard of Time Measurement</i>	279
<i>Measurement of Space</i>	291
<i>Science of Metrics and Coding (Chandaḥ-Śāstram)</i>	292
<i>Theory of sets and classification of the Vedic Meters</i>	298
<i>Meters and Astronomy</i>	299
<i>Sāhitya-Śāstra or Literary Theory</i>	301
<i>The Doctrine of Aucitya or Poetic Harmony</i>	302
17. ASTRONOMICAL INTERPRETATION	303
<i>Elena P. Blavatsky</i>	305
<i>Juriy N. Roerich</i>	307
<i>Subhash Kak</i>	309
<i>Belarusian New Integrated Hermeneutics</i>	312
18. ASTRONOMY AND CALENDAR (JYOTISHA-VEDANGA)	325
19. IMPORTANCE OF TIME	328
20. WORSHIP OF KALA AND MAHAKALA	331
<i>Kālavāda or the theory of Time</i>	332
<i>Kāla-Cakra or the Wheel of Time</i>	333
<i>Types of Months</i>	336
21. LATENT HARMONY OF THE VEDIC NUMBERS	341
<i>Orbit of Candra</i>	343
<i>Yojana as the Mother of Vyāsa</i>	345
<i>The Cycle of hymns to Agni</i>	349
<i>The Cycle of Hymns to Indra</i>	350
<i>The Cycle of Hymns to Soma</i>	352
<i>Orbit of Sūrya</i>	352
<i>Brahma – the Creator of the World</i>	355
<i>Solar System as Family of Brahmā</i>	356
<i>The Period of Life of the Great World</i>	360
<i>Life of Brahmā in Different Chronometric Units</i>	365
<i>Life of Brahmā</i>	365
<i>The Cycle of Seven Ṛṣis</i>	367
<i>Lunar Hours</i>	368

22. THE VEDAS AND MAHAYUGAS	371
23. DIFFERENTIAL CALCULUS OF TIME	374
<i>Bhāskara II</i>	375
<i>Conclusion</i>	375

PREFACE

(to the first Bombay's ed. entitled 'Rigvedic Studies')

We have great pleasure in publishing the book `Rigvedic Studies: 1. Rig-Veda as a Recital Calendar-Chronometer, 2. Chrono-Mytho-poetics of Vedic Hypertext' by Dr. M. I. Mikhailov as the Volume 45 of the Bharatiya Vidya Series.

Dr. M. I. Mikhailov of Belarus has been working in the field of Rig-vedic studies for the last five years. Earlier he worked on `Kshemendra's Didactic and Satirical Poems as a Historical Source' for his Ph.D. Degree. He visited Bharatiya Vidya Bhavan at Mumbai in 1997, to pursue and discuss his Vedic research.

The present work `Rigvedic studies' reveals a less trodden aspect of the Vedic study. He attempts to reconstruct the core pattern of the Vedic recital-based highly spiritual ritualistic calendar. The Author's approach in this technical subject is new and highly interesting.

We hope that Dr. Mikhailov's work `Rigvedic studies' will enrich and inspire the scholars and students of Vedic thought.

Hon. J. H. Dave

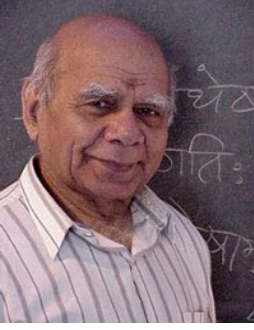
Director

Bharatiya Vidya Bhavan

V.S.2054; Gurupurnima,

Thursday, 9-7-1998.

R. K. SHARMA'S NOTE



Mr. Mikhail Mikhailov is working on a long research project concerning the chrono-astronomical interpretation of the R̥g-Veda. Scholars were immensely impressed with the originality and objectivity of his treatment in his learned papers presented at the 9th, 10th, and 11th World Sanskrit Conferences held at Melbourne, 1994, Bangalore 1997, and Turin 2000 respectively.

I know him as a talented researcher in Indology. His continued original research on the chrono-astronomical interpretation of the R̥g-Veda interests me most. His work on an indological topic of international interest eminently deserves attention.

R. K. Sharma

Formerly Vice Chancellor, S. Sanskrit University, Varanasi;

President, International Asso. of Sanskrit Studies

Date Sep. 29, 2002

AUTHOR'S FORWARD



This INTEGRAL HERMENEUTICS is the first volume of a two-volume book 'Key to the Vedas' dedicated to a stupendous achievement in the field of new Vedic integral hermeneutics – to the reconstruction of the ancient Indian higher computing science and principles of ancient Vedic chronoprogramming. The second volume is to include description and decoding of linguistic-mathematical-astronomical codes of the Veda-Saṁhitās with tables and calculations.

Vedas are collections of scientific formulae in the form of poetic mantras. Vedic mantras (liter. 'guardians of ideas,') as a rule, are treated as poetic stanzas or magic spells containing mainly inconsistent and dark fragments of mythological and poetic character. With the help of computer, we managed to read them as digital codes in accord with the mathematically and calendrically read inscriptions on Indus seals, in which the mathematical data of astronomical observations of hoary antiquity were codified during the formation period of the global Vedic civilization.

The doctrine of the Vedic cryptic astronomical, algebraic and geometrical codes and the method of integrated Vedic interpretation was formulated during application to the Vedic syncretic text of the algebraic binary code, which was discovered in the 'Chandaḥ-śāstra' ('Science of Encoding') of Piṅgala, which was an important algebraic Vedic Science of encoding and metrics. It was considered by the Vedic tradition as one of the Vedāṅgas ('the vital organs' or the most important Vedic sciences.)

The code was created by means of Vedic Sanskrit, a special programming language. Its development in a Vedāṅga treatise, pre-

sumptively, had been necessitated by enciphering and subsequent preservation in memory of large astronomical tables and files of astronomical data, which reached us in the form of the Vedas ('Data,' 'Sciences,') the Tantras ('couplers of astro-ethical manuals,') the Itihāsas ('exact astro-mythological socio-ethical poems,') the Purāṇas ('astroencyclopedias') and the Siddhāntas ('Doctrines.')

The book treats the four Vedas with adjacent literature as an integrated whole with a unique hidden plan, homogenous in content and form. It puts forward a new lunar-astronomical dating of the Ṛg-Veda based on this vision and also an astronomical ascertaining of the place of origin of the Vedic science. It contains also a mathematical-astronomical decoding of the Proto-Indian script and gives new proofs of the theory formulated by authors previously that the Veda-Saṁhitās formed an operational system and calendrical astronomical database of the recital-mnemonic analog-digital chrono-computer.

The Vedas were products of the computing science. As a spiritual nucleus of the chrono-socio-cosmos, they constituted the core of unification of the greatest scientifically organized global state of the ancient world – Vaidic Dharma or Vedic Empire (7th – 3rd millennia B.C.E. according to debatable generally accepted historical dating) a progenitor of all Indian, Asian, African, Slavic, West-European and American civilizations.

The book offers an original decipherment of the most secret Vedic codes, which the academic science is only beginning to be aware of. It highlights ancient India's exceptional contribution to computer science, mathematics, astronomy and ethics.

Academic scholars, experts in ancient Indian culture and literature, and non-academic practitioners and devotees interested in history of mathematics, astronomy, computer science, linguistics, writing systems, literature, mythology, religion and sources of Human civilization will find a synopsis of new discoveries and breaking information on the Vedas, epitome of science of the Vedic civilization, which is highly relevant for the future of our own civilization

and education.

This sensational Belarusian rediscovery of the ANCIENT integrated method of interpretation forms an important turning point in scientific comprehension of the Vedic scriptures and the origins of civilization. The book will show you how you can literally discern a quite unimaginable aspect of the most ancient civilization on Earth – a database-driven chronometrical recital supercomputer, a true digital signature of Aliens or, most probably, academicians of the Lost Paradise in the form of the deepest sacred scripture now known as the Vedas (Sciences,) in front of which Egyptian and Mexican pyramids, Stonehenge and even our contemporary computer operational systems fade and are similar to rude reflections of the original.

A certain proof for this theory has come from a book by Dr. Subhash Kak ‘The Astronomical Code of the Rig-Veda’ (New Delhi, 1994) which I purchased from Banarsidass in 1997. His major arguments and even some end results coincided with mine so strikingly (except only for one point, namely, his assumption that there was no exact chronometrical device in the Vedic times) that it would not be any exaggeration to evince a supposition that the logic of the scientific research formed in the last decencies led us both independently to the same conclusions.

At present, I am finishing writing an extensive Introduction and comments to the first book of my Russian translation of the Vālmiki-Rāmāyaṇaṃ providing a lot of new evidences of calendrical character of ancient Sanskrit Lore.

I have dedicated more than twenty years only to one question: what is the Veda? Progressively, I came to many extraordinary discoveries in the field of mythology, encoding, formal structural analysis of the Vedic texts and even decipherment of the Indus Script.

Here, I am going to present in most concise form main principles of the New (reconstructed) Vedic Hermeneutics. It deals not with the vague symbolism recognized already by so many, but with the corpus of the Vedic scientific disciplines unfolding digital scriptural

and oral codes forming a synergetic chronometric operational system of a complex analogue-digital bio-computer.

I am not supportive of the Indian subjective or nationalistic interpretations nor of those Western, which can be labeled as biased or only critical. My approach tends to be purely objective: I want to understand the essence of the most ancient and deepest scriptures in the world in order to comprehend the origin of our civilization. By the way, sinology has already demonstrated the validity of many interpretational schemes used by us, which are not still generally accepted in indology due to a sharp political ideological confrontation between nationalists and colonialists, materialists and idealists. We as scientists should try elevating ourselves above this bias.

The great deal of research work in the field of Vedic decipherment has produced a huge mass of new mathematical-astronomical exact data, which have been explored by us partly with computer. They must be known to colleagues as an example of high scientific dedication to the Vedic Studies in the Republic of Belarus situated in the heart of geographical Europe, which is technologically and scientifically one of the most advanced among all former Soviet republics and is the only Indo-European country having preserved intact thousands of tadbhava and tatsama Sanskrit words including the very word 'veda' in the sense of Science.

The explanation of the greatest enigma of the Vedas may seem extravagant. However, our theory is partly in tune with some astronomical and textual observations formulated by Dayananda Sarasvati ('Light of True Meaning,') Aurobindo Ghosh ('Vedic Glossary' and 'Secret of the Vedas,') David Frawley, Asco Parpola, M. F. Albedil, B. V. Subbarayappa, Subhash Kak, R. V. S. S. Avadhanulu.

This contribution to the Vedic Studies is non-partisan and original anyway. Moreover, the newest sensational results are in absolute harmony with our earlier calendrical-chronometrical theory of Vedic recitation having been presented at four World Sanskrit Conferences and at a World Congress of Sociology in Bieliefeld (Germany) as

well as at a number of International conferences in Moscow, Minsk, Sophia and Budapest with invariable interest of scholars involved in working out a Vedic puzzle.

I am sure that this theory is the most objective scientific explanation doomed to be accepted after a strict examination. It does not stop to provoke my rapture with every new discovery or step forward.

Everybody is welcomed to suggest an appropriate procedure of international discussion as well as to criticize, to scrutinize my main thesis, even to reject certain points, concepts or principles.

We are on the threshold of a new era of the Vedic Studies opening a harmonious picture of the synthetic Science of the most durable civilization. The inertia of mind of the majority of scholars fortified by the 'political myopia' of the world leaders and chronic absence of financing may stop this great development for hundreds or even thousands of years, as it had been already the case with the Vedas in the past. And the greatest scientific message or digital signature of the ancient Indian Vaidic Dharma Empire (which is much more powerful than Egyptian and Mexican messages) will remain hidden under the rubbish of superstitions and ridiculous prejudices.

The sooner the results of our team Sarasvatī become recognized by Indologists, and validated on a proper scientific basis by historians of astronomy and mathematics, the easier they will be accepted by scholarly community facilitating the progress of the Vedic Studies and the World History.

A mathematical-astronomical rereading of the texts considered generally as exclusively philological, religious-philosophical monuments has led to the discovery of a new field of exact data demanding new theory of interpretation and interdisciplinary Vedic research. Obviously, the new data and the new field having been just found as well as multiple computations are not exclusively philological and not easy to grasp. But every true philologist who explored at least one-two aspects of the Vedic and the Aitihāsik literature or some problems of Indus script decipherment will be surprised and thrilled

by the new methods of integrated textual and logical interpretation of these vast texts generally considered only philological. Everybody involved in these studies will be happy to see the light and new exits out of the one-hundred years tunnel of the contradictory decipherment of the Vedic message. It is of utmost significance that this persuasive, consistent theory is verifiable not only by philological means, but also by the Vedic mathematics represented by such highly specialized and authoritative texts as the Piṅgala's 'Chandah-Śāstra' and the Lagadha's 'Jyotiṣa-Vedāṅga'.

We have logically and mathematically decoded the inner sense, the secret calendrical import of all the strata – devatās, ṛṣis, and mantras (vide II Part.) Therefore, the abstract philological interpretation is to be recognized as one-sided, inadequate, misleading and outdated. Moreover, a number of Vedic inscriptions have been also read mathematically, logically and in full harmony with the main Vedic calendrical-chronometric concepts such as the Life of Brahmā. These readings prove the validity of my main philological, mythological, mathematical and calendrical decipherment of the Vedas.

These readings may seem to represent sometimes a fit of philological virtuosity and involvedness, innovativeness and ingenuity, but in most cases, they are clear and in accord with the traditional methods of interpretation. As such they would be of immense interest and help for everybody concerned with the progress of unbiased scientific decipherment.

Thus, the object of this study was a complex of ancient Vedic Literature and Vedic inscriptions. The methods were primarily philological, but also logical, mathematical and astronomical.

This book have been written first and foremost for Sanskrit scholars who have some interest in the deciphering of the Vedic enigma. Therefore, I have not tried to explain everything and to cover all aspects of Vedic interpretation. My primary purpose was to provide new data, hypothesis, and reinterpretations, which could be helpful in the greater work of reconstruction of the world view of

the Vedic civilization. I have not tried to reduce Sanskrit terms to a minimum and to translate all of them.

Nevertheless, I have constantly in mind needs of general reader. The secret Vedic Science represents truly the most precious World Heritage destined to lead all of us into the future! Or, perhaps, I am amiss: the World Heritage is a possession of the past and presents interest only to a restricted group of scholars and archivists concerned with insignificant philological issues of very narrow import?!

The method of the mathematical interpretation of the most ancient syncretic texts and the data hidden behind the sophisticated multilayer encoding is of significant scientific interest for Cultural Studies, History of Literature, History of Mathematics and Astronomy, and even such disciplines as Semiotics, Programming and Cryptology, because these texts represent not only fits of higher consciousness, but are very old chronocomputer programs.



Nathalia and Mikhail Mikhailov, Sofia, 2002

There is a lot of heavy-duty math and calendrical calculations in this book, but it is nonetheless usable for those who do not understand the math.

This book have become possible thanks to encouragement, advices and other help of many people. I am specially indebted to my

respected teacher late Prof. I. D. Serebryakov (1917 – 1998,) whose interest in Kṣemendra and, especially, Bhartṛhari's 'Vākyapadīya' and Piṅgala's 'Chandaḥ-Śāstra' gave me an impetus to undertake this research.

I remember with great sympathy Indian friends who studied in the former Soviet Union and introduced me to Indian languages and culture: Asit Kumar Adhikari, Parameswaran Chinnappan and others.

I must thank (in alphabetical order) Moscow's Indologists Prof. K. Z. Ashrafyan, Dr. A. M. Dubyansky, Dr. S. D. Serebryany, Dr. E. Vanina, Tashkent's Indologists Dr. S. N. Ermakova, Prof. I. M. Hasimov, Dr. F. S. Salimova and some Sanskritologists met during World Sanskrit Conferences in Melbourne, Bangalore, Turin and New Delhi: Prof. G. Beiley, Prof. P. Bilimoriya, Prof. H. W. Bodewitz, Prof. M. Jezic, Prof. M. Juntunen, late Prof. Mandan Mishra, Dr. P. V. Pathak, Prof. T. S. Rukmani, Prof. R. K. Sharma, Dr. Shivamurthy Swamiji, Prof. Vachaspati Upadhyaya, Prof. M. Witzel for their interest and encouragement in this endeavor and other help.

With deep gratitude I remember Shri Kantisen Shroff who organized my stay in Mumbai and Dr. M. C. Kaul for organizing my living in Delhi, where I could collect some new materials.

It was my privilege to be invited to stay with Prof. S. A. Upadhyaya, Director of Post-Graduate and Research Dept., and to be admitted for some happy days to the library of the Bharatiya Vidya Bhavan (Mumbai.) I was amazed and touched by the attention and full assistance given to me by him. I was very happy to feel the elevated and creative atmosphere of the Bhavan and to see the Vedic principles in realization. I express my deep gratitude to him for his appreciation of my first book on this subject and organization of its publication.

I would also like to thank the former Executive Director of the Foundation of the Fundamental Studies of the Republic of Belarus, Mr. E. I. Vasilyev, the former coordinators of the presently closed

Soros-Belarus Foundation Dr. A. Antipenko, I. Boskin, D. Ponyatovsky, L. Turbina, and others for their understanding and sympathy to this project and making everything possible and impossible to make this great project be known to the world.

I express deep gratitude to the Indian government and Indian embassy in Minsk for their support in publishing and distributing this book.

Especially, I warmly thank my wife Nathalia Mikhailova and my two daughters Maria and Nadezhda for their help in preparing computer programs, formulating and solving mathematical problems connected with the probabilistic evaluation of this hypothesis, translation of the mathematical parts of the Chandaḥ-śāstra, establishing the geographical latitude of the Vedic Academy and other assistance.

Finally, I am greatly indebted to my mother and brother for constant encouragement and support.

Mikhail I. Mikhailov

Gorki, 29 June 2005.

TOP VEDIC ENIGMA (INTRODUCTION)

Then there was neither nonexistent, nor existent, there was neither air, nor a space above it. What was covered? Where, in what deep chasm and under whose cover was there the zodiac (or its fourth sign)?¹

Rig-Veda, X.129.1.

'Restoration of perfect truth of the Vedas is absolutely necessary for the future of mankind'.

Aurobindo Ghosh

The Vedas² ('Witting, Sciences') also called Śruti ('Word,' 'Heard Message, 'Lore of Wisdom') or Śravah ('Glory,' 'Word,' 'Education') are scientific books of ancient India kept in memory of learned brāhmaṇas, according to my astronomical calculation based on new astronomical data found in the Ṛg-Veda and interpreted along the lines of the standard historical chronology, in an unchanged form as a sacred and most secret heritage about nine millennia ago (see Part II.)³ Recently they have been ranked by UNESCO as masterpieces of the oral heritage of the humankind with aim to draw attention of the world community to their value and to encourage the governments to their preservation.

The language, in which they were composed, is considered by learned brāhmaṇas to be a gift granted from heavens, and all subsequent Sanskrit authors show respect to it mixed with surprise and awe.⁴

As a result of several sensational findings and discoveries described in this book, it became clear that admiration commanded by

¹ Translations of mantras are mine – M. I. M.

² We shall use the word 'Vedas' four designation of the 'collections of the Vedic hymns' (veda-saṁhitā-s), whereas 'vedas' for signifying Vedic scientific disciplines.

³ Mikhail Mikhailov, 'Vedic Night Pṛthivī and the Date of the Ṛgveda.' In: Proceedings of the XIth World Sanskrit Conference. Turin, Italy (in progress.)

⁴ V. S. Sukthankar, On the Meaning of the Mahābhārata, Bombay. 1957. P. 41.

the Sanskrit language and literature and the Vedic science really has a good reason.

The most ancient and most influential Indian cultural tradition calls itself Vaidic Dharma ('Vedic or Scientific Establishment' or 'Scientifically Arranged Socio-Chrono-Cosmos.')

Till today it represents the most valuable part of the great historical and cultural heritage of Hinduism, which is usually intently treated as a sort of religion. During our examination of the essence and intentions of the Vedas and such their branches as Vidyās, Śāstras ('Vedic sciences') and Dharma ('Establishment,') incongruity of such interpretation will become clear independently of its origination – whether it comes from the hostilely minded Western missionaries, modern Indian thinkers and preachers or ordinary Hindus. But in order to substantiate this paradoxical statement, we should go deep into a number of rather specific and as the tradition asserts, very ancient concepts and scientific theories.

Hinduism usually is regarded as a kind of religion confessed by the most part of the population of India recognizing authority of such ancient scientific books as Vedas (higher integral 'Sciences,') Pratiśākhya (phonetic and grammatical Comments to various recensions of the Vedic poetic-scientific data collections or Samhitās,) Śāstras ('Textbooks' of various scientific and philosophical disciplines,) Āgamas (astro-mythological philosophical 'Introductions' or 'Revelations,') Tantras ('Clusters' of ethical-psycholinguistical manuals on the organization of socio-chrono-cosmos and rules for individuals, families and state,) Itihāsas (astro-mythological chronometric 'Mythopoems' and astro-mathematical Databases,) Purāṇas ('ancient Chrono-Mytho-Encyclopaedias,') Siddhāntas ('Canons' of astronomy and other sciences.)

Vedic philosophy and science in a number of waves largely influenced Asian and European mentality. British orientalist Philip Rawson affirms that 'there can no longer be any real doubt that both Islam and Christianity owe the foundations of both their mystical and

scientific achievements to Indian initiatives.’

And, what is of utmost significance for our topic, its main scientific aspirations and goals have not been totally abandoned. Australian Historian Arthur Basham wrote in his famous book ‘Wonder that was India’: ‘The ancient civilization of India differs from those of Egypt, Mesopotamia and Greece in that its traditions have been preserved without break to the present day.’

The ancient Vedic philosophy and science underlie all major cultural tendencies in Europe and, what is more, are directly extolled by many modern thinkers among whom philosophers of the caliber of Arthur Schopenhauer, Leo Tolstoy, Mahatma Gandhi and Albert Schweitzer, and such scientists as Albert Einstein, Erwin Schrödinger and Constantine Tsiolkovsky are present.⁵ Namely people inspired by these aspirations forge a scheme for the future scientific and ethical global civilization. This science is all-encompassing and is not exclusively limited to spiritualism, psychology, philosophy, religion and mysticism.

As Prof. Subhash Kak from the University of Louisiana argues, ‘Western scholars have considered spirituality and psychology to be the main contribution of Vedic thought. That this is incorrect is clear from the recent scholarship that shows that the Vedic people knew considerable mathematics, astronomy, medicine and other sciences.’ <...> ‘Modern India produced a number of brilliant scientists such as Jagadish Bose (1858 – 1937) in electromagnetics and plant life, Srinivas Ramanujan (1887 – 1920) in mathematics, Chandrasekhar Venkata Raman (1888 – 1970) in physics, Meghnad Saha (1893 – 1956) in astrophysics, and Satyendra Bose (1894 – 1974) in quantum theory.’

We must remember that the scientific revolution and technical progress in Europe started exactly with the implementation of the Vedic decimal calculus in the late Medieval Ages! Namely, Vedic

⁵ Constantin E. Tsiolkovsky (1857–1935) – Russian philosopher, writer, scientist, astronomer, inventor and rocket expert.

ethical outlook preserved by the Slavs in Russia and the brāhmaṇas in India was at the basis of the global ethics of Leo Tolstoy and Mahatma Gandhi. Now, the world is once again on the threshold of a new great social, philosophical and scientific revolution, which is being brought about by deepening of our understanding of the true purport of the Vedas. This is not an easy and swift process. Our Indo-European civilization, the cradle of all other civilizations, has lost its political unity and the essential understanding of the basic Vedic texts.

Those Hindus who deeply understand the essence of Sanskrit ‘Sacred Scriptures,’ profess a special breed of religion, namely adoration of Knowledge, Science, Logic and Truth. In this context, Hinduism can not be treated as a religion at all. More likely, it is a scientific heritage of the peoples of India, which nucleus is the Sanskrit culture representing a set of natural sciences, philosophical, calendrical-mythological, aesthetic, sociological, legal and ethical disciplines and norms.

Nevertheless, all Hindus without any differentiation are opposed, as, for instance, in the Act of 1955, codifying the Hindu civil law, not to citizens of other countries, but exclusively to believers – to the Moslems, the Zoroastrians, the Jews, the Christians and, what is not justified in any way, even to the ancient Indian Lokāyatikas (dialecticians,) the Buddhists, the Jainas and the Sikhs, which represent currents of the Sanskrit and derived learning more closely interconnected with the world, with politics, with the spoken languages of various regions of the subcontinent, such as the Prākṛts, the Apabhraṃśas and the new Indo-Aryan local idioms. The same is true in relation to medieval religious currents of bhakti movement (‘devotion’ to a Vedic deity,) which had been developed within the new Indo-Aryan languages and even reflected to some extent the influence of Islam, as, for example, the Sikh religion. Similar one-sided definitions are consequence of the Eurocentric criteria imposed on the Anglo-Indian intellectuals by the colonialist Indology.

Essentially, Hinduism is Ancient Indian culture, education and science, produced by a civilization considered nowadays a prehistoric one, but which preserved its color and national clothes. Therefore, not without a regret, it has to be noted that in modern India following as a rule principles of the West-European education and sociology, Hinduism is laid into Procrustean bed of a national religion, to which approximately 83 % of the population ostensibly adhere.

If to speak about the Vedic religion as a worship of Science embedded in the Vedas, there is hardly someone else trying to follow it except for a small aristocracy of talent consisting of the most expert brāhmaṇas, scholars and scientists. Narrowing the meaning of the term 'religion' to a 'religious etiquette,' ritual, custom and routine, we can trace its presence in this quality even far outside India – in Sri Lanka, Pakistan, Bangladesh, Indonesia (island Bali,) Southeast Asia, Fiji islands, Mauritius, Guyana and the Republic of South Africa. However, mistaking external rules of etiquette for a form of religious belief, certainly, is the output of indiscrimination and contamination of notions.

During the last century, Hinduism has got some popularity among small groups of intellectuals in Europe and America as a kind of mystical paradoxical philosophy.

It is regarded by Western intellectuals as one of the most widespread global religions, similar to Buddhism, Christianity and Islam, which nowadays are secularized in all advanced countries, and, hence, have, generally, only ethnographic and historical interest.

In 'mass consciousness,' Hinduism is damned to be associated only with what is called in Europe 'mysticism' and 'religion.' For instance, Klaus K. Klostermaier,⁶ the author of a popular exposition of Hinduism, though recognizing that it can not be defined within parameters used for Christian Churches and being aware of the criticism of Edward Said in his 'Orientalism' rejecting such colonialist

⁶ Klaus K. Klostermaier. *Hinduism: A Short Introduction*, Oxford, 2000 (1st ed. 1998).

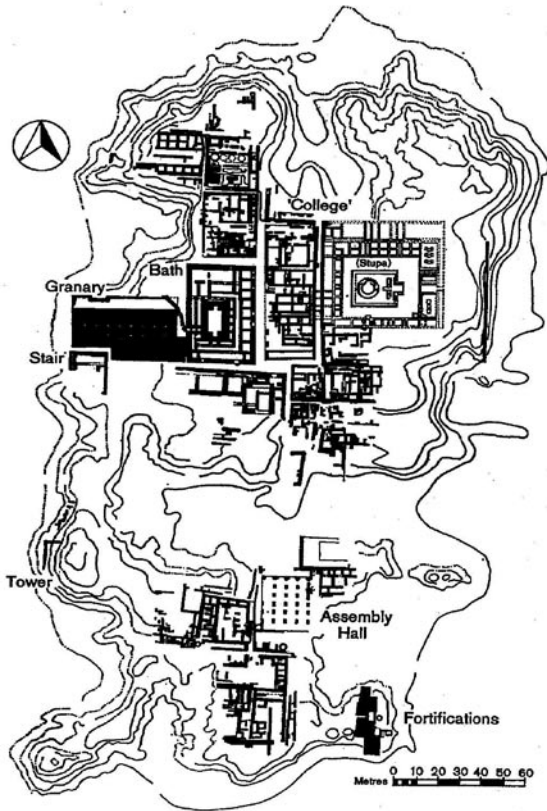
constructs as ‘Hindu religion,’ accepts the term trying to understand its ‘unique character,’ of course, in the controversial perspective of such concepts as ‘religion’ and ‘faith.’

The point of view considering Hinduism a kind of religion is fixed in numerous editions and authoritative encyclopedias among which, perhaps, one of the biggest in the world is 18-volume illustrated ‘Encyclopedia of Hinduism’ being prepared for publication, which should embrace over 10000 articles belonging to 1250 scholars of different countries.

Such a narrow approach to an ancient, but still alive, Indian culture is rejected by many serious researchers, who not once noticed unfitness of Eurocentric categories of the European sociology, in particular, of such concepts as ‘religion’ for a description of rather complex cultural and social phenomena of India. There is an understanding that what is labeled ‘Hinduism’ has two aspects: ancient and modern – one true, though half-forgotten, and another prejudicial, though more widespread. However numerous and impressive were religious publications, they cannot eclipse the truth and impose the view that the ancient science and culture, even under a cover of myths and ceremonies, are something minor in relation to religion and not containing anything noteworthy for a modern educated person. You will be soon convinced by a set of authentic and strongly established facts that the matter should be presented just the opposite way, and, thus, we need to be freed from a set of stereotyped opinions and illusions concerning character of the ancient Indian science.

It is known, that the term ‘India’ as well as the word ‘Hinduism’ go back to an ancient Persian word ‘Hidu’ (later ‘Hindu,’ ‘inhabitant of Sindh and India,’ Indian) found in inscriptions in Naksh- -Rustam and Persepolis of the kings Darius I (522 – 486 B.C.E.) and Xerxes I (519? – 465 B.C.,) king of Persia (486? – 465) and son of Darius I. Hence, the term ‘Hinduism’ has a geographical origin (meaning nothing else than ‘Indianism’) and is not met in the Sanskrit sacred books. As a religious term, ‘Hinduism’ had been introduced by Euro-

peans as late as the XIXth century for a designation, in general, of any 'beliefs, creeds and faiths,' which had originated in India. Therefore, it is as abstract and vague as the concept of a 'European culture.' Researchers note that distinctions between Islam and Christianity or between Judaism and Zoroastrism are less expressed, than between



Plan of the center at Mohenjo-daro

any extreme currents of Hinduism.

Even having limited the concept of religion to the content, which might have been attributed to the category of religion, it is necessary to recognize that in Hinduism it is absolutely impossible to assign either the common credo, or a set of dogmas. In it, there is neither

universally accepted Scripture, nor dogma. It has no common Church, nor ritual, because Hinduism embraces not one, but a group of related ideological, scientific and mythological-philosophical systems connected to some extent by territory, historical destinies, literary style and a spiritual-cultural heritage.

Moreover, Hinduism can not be reduced not only to the concept of 'religion,' but also to the other kindred vague concept of 'philosophy,' which sometimes is substituted for it. Though the mythology and philosophy are present in it in all their aspects and shades, they are not self-sufficing and unique content of the Vedas. More likely, they carry out a service role in the Vedic scientific astronomical research and in the organization of the life of the Vedic chronosociety, an astronomically oriented civilization consisting of academicians-astronomers, observers, scribes, guards, peasants, workers and servicemen and functioning in time and space of the Solar Universe, well thought-out and poeticized by artistic imagination.

As a specific socio-cultural civilization Hinduism had arisen during the period of the early agricultural societies (10-7 thousand years B.C.E.,) reached the apogee in the 3rd-1st millennia B.C.E. during the florescence of the greatest state of antiquity nowadays called Proto-Indian, Indus Valley or – it is the narrowest and most inexact term – Harappan civilization (under the modern name of one of the largest archeological sites.)

Cultural monuments of this civilization in the form of more than two thousand dug out settlements are concentrated, mainly, in the Northern and the Central India spreading from the Indus-Ganges interfluvium up to the Godavari River and beyond it. It was highly developed civilization with an organized town planning, a highly developed script, a unified system of standards, a carefully thought-over organization, a developed exact science, and a perfected astronomical-mythological calendrical system. Town planning is inherent in all settlements, besides, it demonstrates astronomical pattern and careful equability, uniformity and similarity of housing scheme.

E. Richter-Ushanas⁷ and some other researchers argue that the signs of the Indus script have close relation to the Brāhmī and the Devanāgarī alphabets. The inscriptions on seals and ceramics, sometimes similar to those used today by Tantric, Vaishnava and Shivaite believers as abstract religious symbols, were, in my opinion, first of all calendar symbols of particular days and months (vide the 2nd Part.)



There are images of female deities, ‘mothers’ or personifications of Nights and Constellations called nakṣatras, whose cult is nowadays widespread all across India and is especially characteristic of Shaktism. A part of those signs and calendar symbols is used even today by Tāntrikas, Vaiṣṇavas and Śaivas.

Most probably, the formation of the basic nucleus and main branches of the grandiose Vedic complex of scientific and philosophical Sanskrit literature, which became the core and the foundation of the spiritual, cultural, and social-political unity of the huge city type state, had occurred in that Proto-Indian period (VII – II thousand B.C.E.)

The peoples of different ethnic stalk, which had developed this Sanskrit Vedic culture were worshipers of the New and Full Moon gods such as Indra and Agni. They called themselves Ārias (Aryans, ‘enlightened,’ ‘radiant,’ ‘bright,’ ‘educated,’ – cp. Russian jaryj, ‘ardent adherent,’ jarkij, ‘bright,’ Slav. Jarilo, Jarovit, god of the Sun or the Moon.) The other self-appellation was characteristically Śravakas (Slav. ‘Slovaks,’ ‘Slavjane,’ ‘Slavs,’ ‘Slavic peoples.’)

The latter cultural term had the general vogue, in particular, among the Buddhists: all novices or pupils, and also Buddhist

⁷ E. Richter-Ushanas, *The Indus Script and the R̥g-Veda*. Delhi, 1997. Pp. 191–194.

scientists, scholars and saints named themselves śravakas (Rus. ‘poslushnik,’ obedient student, educated man) in general (cp. the Slav term ‘pravoslavniy,’ ‘well-educated,’ ‘orthodox.’) As it is evident from etymology, both the first and the second term had had exclusively cultural import, excluding any ethnographic, or, especially, racial connotation till the times of Buddha or even later. The Proto-Indian State was populated by an amalgamation of many peoples and linguistic situation was not less complex than in the Mauryan Empire (322 –184 B.C.E.)⁸

Approximately from the middle of the IInd millennium B.C.E., the significant part of the territory of this superstate, in particular, adjoining to the Indus River and its inflows, starts to decline under the influence of geotectonic shifts caused by collision of the peninsula Hindustan with Asia, earthquakes, changes of the riverbeds and desertification.⁹ Population of the Indus Valley moved into the Gangetic Valley, to the South India, to the South East, Middle East, Central and Near East Asia, North Africa, Americas, to the Eastern and Western Europe. The opposite conjecture, though being very popular and prevalent, is contradictory and untenable.¹⁰

One of the inevitable consequences of the migration of these most ancient ‘Slavs’ or ‘civilized Vedic peoples’ from India was dissemination of Sanskrit language, Vedic and Buddhist outlook, logic, philosophy, education and science in all the ancient World.

That these Vedic Slavs were the ancestors of modern Slavs is indicated by a high degree of cultural and linguistic affinity depending partly on distance from ancient India in space and time: the further we

⁸ Michael Witzel, Substrate Languages in Old Indo-Aryan (Ṛgvedic, Middle and Late Vedic). In: Electronic Journal of Vedic Studies, Vol. 5, issue 1 (September), 1999.

⁹ Dr. S. Kalyanaraman, The River Sarasvatī... P. 2-5.

¹⁰ Buddha Prakash, Ṛgveda and the Indus Valley Civilization. Hoshiarpur, 1966. Pp. 121–146; D. Frawley, Gods, Sages and Kings... Pp. 249 – 262.

are – the less are similarities and the more are distinctions. Ancient Iranian peoples are most closely related to ancient Indians, then ancient Slavic peoples follow, then Lithuanians, Greeks, Lateens, at last Celts, Germans and Romans. If ancient Iranians are so similar that it is simply difficult to distinguish them from ancient Indians, and many places in Avesta are almost identical to the Vedic passages, relationship of modern Roman and Indian peoples is not so obvious.

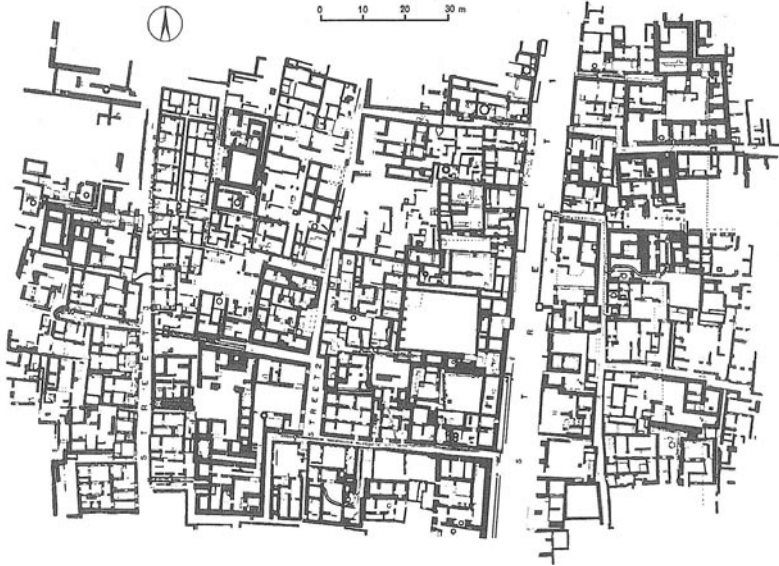
Taking into account, that the Iranian and the new Indian languages had been significantly changed under the influence of Islam, among the modern Indo-European languages the Slavic appears to be the most close to the ancient Vedic Sanskrit. A remarkable trace of the Vedic culture in the Belarusian language is the very word ‘veda’ (‘knowledge,’ ‘science,’ cp. ‘wit,’) by the way, not having been preserved in such a pure form anywhere in Europe.

The whole territory populated by the Slavs is marked with thousands of geographical Sanskrit and Buddhist toponomical names, among which there is plenty of cities and settlements with such Sanskrit roots as ‘Buda’ (Buda, Buda-Koshelevsk, Budapest, etc.) going back, in my opinion, to a name of the mythological Buddha, the founder of the Union (Saṅgha, Sayujyam, Slav. ‘sajuz’) or Scientific United Global State. That Buddhism disappeared in Europe having been engulfed by Christianity without a vestige to remain cannot be a negative argument, whereas in India itself it had been violently annihilated by Islam nearly a thousand years ago.

Scientific, artistic and mythological concepts of the Proto-Indian Vedic-Buddhist civilization form the basis of the Hinduism and can be easily separated from the subsequent cultural strata. Though Proto-Indian texts represent only brief inscriptions on seals, vessels and other archeological objects, which till the latest time have been defying all attempts to decode them, the Vedic scholars, fortunately, have preserved in memory the earliest monuments of the ancient Indian and Indo-European sciences, philosophies and literature, called the Vedas.

The Vedas (cp. Bel. ‘vedy,’ ‘sciences;’ Rus. ‘svedenja,’ ‘data’) break up into two categories – the Śruti (the ‘Word Heard,’ ‘Revelation,’ ‘Hearsay’ or ‘Oral Tradition’) and the Smṛti (‘Memoranda,’ the Codes of basic Laws and Instructions) – covering all branches of knowledge of the ancient civilization (see the chapter devoted to the New Vedic Hermeneutics and the chapter on the Binary Code.)

The Śruti consists of the four Vedas – the Atharva-Veda, the Ṛg-Veda, the Sāma-Veda and the Yajur-Veda, correlated by tradi-



Plan of Harappa

tion with the four cardinal points, the lunar quarters, the seasons of the year and dedicated accordingly to Mercury, Jupiter, Venus and Mars. Each of the Vedas is represented by a Saṁhitā (‘composition’ or ‘conjunction’ of mantras under the form of hyphenless stanzas in syllabic meters, and being in content – as it has been established by us – astronomical-calendrical chronometric encryptions.) Every Saṁhitā is supplemented with Brāhmaṇas (astronomical-mythological ex-

planations of the hymns of the Samhitā,) Āraṇyakas and Upaniṣads (mythological-psychological interpretations of micro-macrocosmic Vedic riddles.)

My strong persuasion that the whole body of the Vedic texts was composed according to one mathematical plan elaborated by an Academy is supported by a recent linguistic analysis of the Vedas by Rayalu Vishwanadha.

R. Vishwanadha in a paper ‘Vedic Language’ informs us that, according to tradition, Veda, regardless its subdivisions, is one book: ‘Also, the book appeared on the intellectual horizon at one time. This view was held, without exception, by all the earlier commentators such as Uvvaṭa, Mahīdhara, Viṣṇu Sūri, Bhaṭṭa Bhāskara, and Sāyaṇa, to name a few of the long list.’

The Western scholars tried to impose on Indian good nature and to inflict a different view stating that the Samhitās belong to an earlier age and Brāhmaṇas to a later one. The Ṛg-Veda was the earliest and the others followed much later, as Sanskrit language of the Samhitās is different from that of the Brāhmaṇas in style. Vishwanadha has analyzed the Vedic language and came to the following conclusions:

‘1. Vedic language is different and older than any other known language;

2. It is the only language suitable to express the underlying thought, common in all volumes of the book;

3. No single volume is complete and it is the Vedic language that binds all the volumes together into a cohesive, complete, self contained book;

4. All volumes are of the same language and could not have been of different authors at different times.’

Sāyaṇa, the famous Vedic scholar of the XIVth century, says that the total number of the Vedic schools was 1127.

The Ṛg-Veda (‘Science of the astrochronometrical Formulae,’) the greatest in volume and most original of all the four collections

of mantras, is dedicated to Bṛhaspati, the god of the full moon and the planet Jupiter.

It existed in 21 editions. The later Ṛgvedic tradition has only two schools: Aitareya and Kauśītaki.¹¹ According to some authors, the main text had five different recensions. Only one called Śākala is extant and the other, Vāṣkala, called Upa-Śruti ('secondary Śruti,') is known only by citations. The edition by Śākala consists of 1028 hymns and 10 maṇḍalas (lit. 'Cycles, Orbits.')

The 1st and the 10th maṇḍalas having identical quantities of sūktas ('exemplary formulae' or 'canonical speeches') belong to several families of heavenly ṛṣis (spatial 'wanderers' and 'seers' of mantras, which are embodiments of lunar phases treated as planets, planets themselves, days, months and years,) the others have different size and belong to different 'families' of ṛṣis. For example, Atri is the father of the Moon Candra, Aṅgiras is the father of the four lunar 'maidens' personifying Nights of the new moon and the full moon periods, Bharadvaja is Mars and, probably, a phase of the moon.

The number of songs in these two maṇḍalas coincides perfectly well with the number of days in the big intercalary year of fourteen sidereal months: $191 + 191 = 382 = 27.3 * 14$.

This circumstance helped me to decipher the first enigma: the structure of maṇḍalas reflects the calendrical character of the Vedic hymns recitation.¹²

¹¹ Sukumari Bhattacharji, *Literature in the Vedic Age*, Vol. I, The Saṃhitās, (Bagchi Indological Series 3). Calcutta, 1984. Pp. 3 – 5.

¹² M. Mihailaw, 'Tajamnica Vedaw: Kaljandarna-hranaljagičnaja gipoteza pahodžannja vedyjskih s'pevaw' ('The enigma of the Veda: The calendar-chronological hypothesis of the origin of the Vedic recitations.') In: Kriwja: Crivika, Baltica, Indogermanica, Issue I. Mensk, 1994. Pp. 63 – 74; M. Mikhailov, 'Calendar-based Vedic educational pattern.' In: IXth World Sanskrit Conference: Abstracts, January 9 - 15, 1994, Melbourne, Australia. Melbourne, 1994. P. 150.

The other maṇḍalas have different proportions and their combinations really produce all the other important calendrical periods of the ancient observational astronomy (see the chapter on the Vedic sukta-calendar code in the 2nd Part.)

As I understand now, this calendrical organization of the hymns reflects only the upper part of a much more complicated chronometrical syllabic-mantric structure of the Vedas.

The 9th maṇḍala is a collection of hymns lauding exclusively the god Soma (personification of the moonlight and of the synodic, draconian and sidereal months in their relation to the Lunar eclipses.)

Hymns (sūktas) of the maṇḍalas recited by heavenly ṛṣis are addressed to lunar deities (devatās), eulogize their feats and greatness, appeal to them for granting of long life, wisdom, prosperity, earthly blessings, posterity, abundance of food, victory over enemies. Each maṇḍala begins with the hymns to Agni, then the hymns to Indra follow – the two most significant lunar gods.

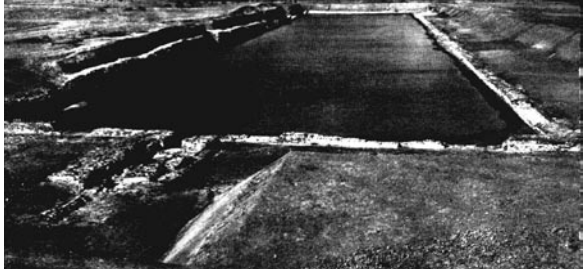
The hymns to other lunar, planetary, and calendar gods, to the Night, their ‘Mother’ and the Empress of the Universe, and her embodiments go after.¹³

As it had been revealed earlier in my commentaries to the Russian translation of select Kṣemendra’s poems, the number of songs in all the maṇḍalas is isomorphic to solar (28 days,) synodic (29-30 days,) sidereal (27-28 days) and conventional months of the Draconian year (29-32 days.) Their various combinations recreate Solar Sidereal, Lunar Synodic, Lunar Sidereal, Draconian, and Anomalistic years of ancient observational astronomy used in planetary-lunar-solar coordinating periods, such as the Metonian cycle or the Solar and Lunar eclipse period, the Saptarṣi Cycle (the Cycle of the Seven Ṛṣis consisting of 2700 years,) the Mahā-Yuga (the ‘Great Cycle,’) the Brahmā-Āyu (the ‘Life of Brahmā or Creator of the Solar Universe,')

¹³ M. Mikhailov, Vedic Night Pṛthivī and the Date of the Ṛgveda. In: Proceedings of the XIth World Sanskrit Conference. Turin, Italy (in progress).

etc., and calculation of eclipses of the Sun and the Moon.

The lunar model of recitation is characteristic of psycho-physiological doctrines of the Tantras and the Yoga-Śāstra, sociological system of the Dharma-Śāstras, the Purāṇas and the Itihāsas. It is used also as a metaphor in philosophical concepts of Vedānta and other



Sea boats and a dock in Lothal

philosophical darśanas (‘views, reviews.’)¹⁴

Numerous hints contained in these astro-calendar hymns permit to reconstruct the wide panorama of the ancient state, its urban and rural life, characterized by order, consent, unanimity and unity of citizens in days of peace and war with internal and external enemies presenting the Vedic ideology as a kind of Utopia, maybe in part actualized in the cities of the Vedic State in ancient India, Iran, Russia, Greece and other adjoining countries.

Cities and fortresses are mentioned repeatedly, occasionally with a strange epithet ‘iron’ and the request to protect them from enemies, sometimes with the appeal to destroy the strongholds of an adversary or rebellious kings.

There are mentions of large vessels having one hundred oars and sailboats (depicted also on seals and substantiated by archeological findings similar to the big reservoir in the Proto-Indian Lothal, which is identified as a dock.) The Vedas also refer to animals, characteristic of India, such as elephants, camels etc., represented also on seals.

¹⁴ P. A. Grintzer, A Lunar Myth in Bāṇa’s Kādambarī. In: The IXth WSC: Contributions of Russian scholars. Moscow, 1993. Pp. 21–31.

All this conclusively testify of the Indian origin of these literary monuments. The most important chronological and geographical evidences will be examined in the chapters concerning the place of creation and date of the Vedas.

The image of a multifaceted horned god sitting in a pose of a Yogi on a throne is without effort identified as Śīva-Paśupati (‘Benevolent God the Pastor.’) A picture representing a hero inside the peacock (it is obviously a ‘vāhanam,’ a ‘carrier,’ riding animal of a deity) surrounded by six stars (Kṛttikās, Pleiades,) most likely, represents Skanda, the son of Śīva known also under the names of Kārttikeya (‘the Son of constellation Kṛttikā’) and Ṣaṇmukha (the ‘Six-faced’ god of the Moon.)



The hymns contain a lot of statements, testifying of existence of the advanced mathematical and philosophical thought. The poetic form of the monument, which reflects mathematically devised metric system built on the basis of binary code, arranged phonetic, stylistic and dramatic rules, is considered a standard of poetic skill (see infra paragraphs on the Chandaḥ-Śāstra and a chapter on the Binary Code in the 2nd Part.)

The Yajur-Veda (the ‘Knowledge of sacrificial formulae’) is a collection of yajus, ‘sayings’ and ‘prayers’ with clear mathematical and calendrical purport accompanying calendar rites of lunar synodic and sidereal observations. This Saṁhitā lists 28 zodiacal lunar stations

connected with sidereal month and solar year: $28 * 13 = 364$.

The text is extant in two recensions forming the 'Black (Kṛṣṇa) Yajur-Veda,' in which hymns are supplemented with comments (Brāhmaṇas,) and the 'White (Śukla) Yajur-Veda,' consisting of 40 chapters, in which hymns are distributed according to a solar-lunar calendar cycle.

The Atharva-Veda (the 'Knowledge of Atharvan') consists of 20 chapters containing about 6 thousand verses. Spells are divided into atharvana and aṅgīrasa types, according to the names of the 'celestial priestly clans,' which are collections of symbolical terms for different aspects of particular planets (that is why the monument is called also the 'Atharva-Aṅgīrasa.')

Hymns in honour of Kāla, Time personified, the Empress of the Night or the Night Sky, in honour of the 28 Lunar Constellations, Agni, Indra and other lunar deities contain descriptions of the calendar-chronological models of the chronocosmos, which are frequently mistaken for cosmology or cosmogony. But their true meaning and significance are connected with the time reckoning.

Descriptions of symptoms of illnesses met in a magic and astronomical context testify to existence of the concept of unity of cosmos and microcosm, which is developed in greater detail in the Upaniṣadas, as well as to the existence of medicine and astrology.

The Sāma-Veda (the 'Knowledge of the Chrono-Chants') consists entirely of select mantras of the Ṛg-Veda and the other three Vedas, distributed according to the order of their performance by the chanters (udgaṭṛs.) The text is extant in two recensions. The first is represented by the Kauthuma (1810 verses, taken erroneously for the Vulgate,) and the Rāṅyānīya (from Gujarat and Maharashtra respectively.) The second is the Jaiminīya or Talavakāra (the Carnatic.)

The Sāma-Veda is divided into two parts each having two supplements: the first one includes hymns to three lunar deities Agni, Indra and Soma; the second one is devoted wholly to the ritual 'sacrifices of Soma' or to the astronomical ceremony of symbolical

‘feast’ for a lunar deity consisting of a ‘drink’ of sunlight. The text is supplemented with four ‘songbooks’ (Gānas) with notes, which testify to the existence of the musical theory reflected in the later ‘auxiliary Vedic science of lunar singers Gandharvas’ (Gandharva-Upaveda,) devoted to music. Scholars noted similarities of the Sāma-Veda and Gregorian Byzantine and Russian chants.¹⁵ But true meaning of this musical notation is considerably higher as it was connected with the top-secret ternary code.

Thus, the four Vedas, harmoniously divided into two, ten, twenty and forty chapters, are structurally, topically and intentionally interconnected and form, as we shall see later, an integral whole. Besides, all of them had been correlated to the cycles of the nine planets of the ancient Indian observational astronomy. All this compels us to scrutinize their scientific content and to try to determine the cyphered mechanism of their astronomical-poetic interaction.

Wide-ranging Vedic scientific manuals of different sciences of the Smṛti class or Śāstras (with astronomical or other scientific purport) embrace branches of practical and theoretical knowledge divided into several groups.

The Pratiśākhya are Phonetic, Grammatical and Metrical Comments vital for correct recitation.

The Brāhmaṇas represent the ‘Great Astro-Mythological Comments’ and the Upaniṣadas are the ‘Secret Lectures.’

The Vedāṅgas are ‘Organic Parts of the Vedas’ including texts with pure exact science purport such as the Vedāṅga-Jyotiṣa treating Vedic calendar etc.

The Veda-Darśanas (‘Reviews of Vedic thought’) embrace special philosophic disciplines such as the Mīmāṃsā (‘Hermeneutics etc.’)

The Upa-Vedas are ‘Auxiliary Sciences.’

¹⁵ Sukumari Bhattacharji, *Literature In The Vedic Age*, Calcutta, 1984. P. 169–170, with reference to J. M. van der Hoogt, *The Vedic Chant Studied in its Textual and Melodic Form*, Wagenigen, 1929. P. 72.

The Purāṇas ('Chrono-Cosmogonical Legends') consist of the 18 Great Poems, the 18 Auxiliary ones and a host of 'Local' ones.

Two Itihāsas ('Databases') are true ancient encyclopedias in the garbs of mythological epic poems.

The Vedic edifice is embellished and supplemented with 64 Vidyās, Śāstras, Sūtras and Tantras.

The Vidyās are applied 'Sciences' and handicrafts. The Sūtras are collections of 'sewed aphoristic rules' of a particular doctrines.

The Śāstras are 'manuals' or 'textbooks' on natural science, social, psychological-physiological and ethical-philosophical disciplines dealing with four sides of life: economic, public, family and individual – artha, dharma, kāma, mokṣa. The nucleus of a Śāstra is represented by a brief, sometimes extremely specialised, text (prosaic Sūtra or poetic Kārikā) with a primary commentary (Bhāṣya) and, as a rule, some more detailed explanations and glosses. These text-books were composed usually according to the scheme later drawn by the founders of the navya nyāya (the 'New Logic'): first, the definition of the field of research is given, then the terminology, concepts and various definitions are examined.

Numerable Tantras are 'couplers of manuals' or thematic selections of textbooks on chrono-spatial creed-law-ethics. Though being slightly detached from the Vedic complex, they do not at all stand separately.

Such scientific disciplines as algebra and geometry, observational and mathematical astronomy, medicine and sexology, philology (with such subdivisions as Vedic textual criticism, etymology, phonetics, grammar, poetics, metrics,) law and political science, sociology and philosophy with all its main branches (cosmology, mythology, ontology, metaphysics, epistemology, logic, dialectics, psychology, ethics, aesthetics, philosophy of language, theology, eschatology,) are systematised in the first millennium B.C.E. at a level quite comparable to modern methodology.

The Upavedas or auxiliary sciences embrace the Ayurveda

(medicine,) the Dhanurveda (military science,) the Gandharvaveda (musical theory) and the Sthāpatyaśāstraveda or Śilpaśāstra (science of sculpture and architecture.)

Even those Vedic texts, which outwardly seem to be only artistic or poetic compositions, belong to the domain of exact science, because they contain both the important scientific data, and sometimes, entire scientific compositions serving as auxiliaries of correct interpretation and exact functioning of the Vedic chronometric recitation and calendar calculations.

Variety of subject matter, the volume of this scientific-literary heritage as well as magnificent complexity of implied sense and the techniques of recitation, and, particularly, surprising beauty of generalizations and classifications, all those and many other qualities testify to a high level of development of scientific thought of an



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original civilization, but, at the same time, interfere with correct scientific understanding of the parts and overall flamboyant Vedic scientific complex.

Really, the scientific thought of ancient India and its technology have influenced and continue to produce the deepest and all-round impact on culture, education and philosophy of all Ancient and Modern World, including such ancient countries as Iran, Russia, Greece, China, Tibet, Japan and Indonesia. Scientific revolution and technical progress in Europe in the late Middle Ages, in my view, started from wide application of the Vedic decimal notation! The modern scientific computer technology is a rediscovery of the ancient Indian higher mathematics and mathematical logic.

But though already more than two centuries have elapsed since the publication in 1801-1802 in Europe of the first Sanskrit grammar and Latin translation of the Upaniṣadas (made by Anquetil Duper-

ron, 1755-1805, from Persian translation of Dara Shukoh,) which represent a final philosophical part of the Vedic canon called Vedānta ('Epitome of the Veda,') the true meaning and significance of the Vedas and adjoining scientific treatises in view of both their volume and the complexity of their scientific language have remained till now the topmost enigma.

M. Haug, who had been trying in the XIXth century to find among brāhmaṇas, keepers of Vedic rites and ceremonies, at least one person indeed understanding their ancient meaning, function and intentions and capable to explain sacrosanct secrets of the Vedic 'religious rite,' had been disappointed.¹⁶ The very Sanskrit name of the Vedas specifies their character as scientific books. However, till present they reliably have been hiding their scientific secrets under the garb of religious scriptures.

Vedic scholars not once paid attention to the symbolical or ciphered character of the Vedic language, noting that encrypted verses or poetic riddles quite often are met in all Vedic texts. There is also no lack of modern hypotheses about scientific ciphered content of the Vedas. Their symbolical character has become absolutely obvious to some gifted scientists. Moreover, Vedic hermeneutics itself or the theory of interpretation of the Vedas amounts to some thousands of years. A lot of efforts have been made with the purpose of elucidating the Vedic enigma. But alas!

Moreover, up till now, nobody have tried to prove a necessity of an integrated research of all the Vedic disciplines with the purpose to develop a fundamental theory of the Vedic codes and their synergetic application in interpretation of the Vedas as separate branch of knowledge. As far as I know, there is no monograph devoted to this problem.

Most likely, our views of the ancient prehistoric civilization,

¹⁶ Aitareya Brāhmaṇa of the Ṛgveda. Ed., Tr. and Explained by M. Haug, Vol I, Bombay, 1863.

inherent in prejudice and rezoning of both ordinary and ingenious representatives of our civilization, are lacking something rather essential. Maybe, they are strongly politically engaged, and our methods of textual criticism do not correspond to their complex scientific-poetic architectonics.

Almost certainly, the deepest spiritual efforts are not easily detected and appreciated being similar to diamonds, which are formed under extreme pressure and temperature. Such efforts appear completely concealed from an extraneous glance. An ordinary observer is completely unaware of the fact that modern scientific and technical revolution is in direct dependence on the philosophical and scientific-historical revaluation and deeper reconsideration of true foundations of the Vedic scientific outlook. Whereas fruits of the technological revolution are obvious to everybody, its foundations and the true value of the Vedic exact science, chronology, astronomy, mathematics, linguistics, psychology, ethics, synergetic logic, linguistic programming of the chronocosmos and calendar-astral mythology are realized only by a few.

Such understanding is not an easy and fast process, in any way it is not a 'revolution' or ridiculous 'perestroika' of consciousness. It is centuries-ancient movement of public conscience to harmony of life naturally programmed by our Big Universe. I am sure, that this conscience is always fully present in all civilizations of the Universe, though it externalizes itself during this or that epoch non-uniformly, but in different ratios and degrees. There was time, when it appeared in ancient India in splendid garments of scientifically devised artificial Sanskrit language with its refined and ramified science, literature and scientifically, not democratically and chaotically, organized Indo-European community of peoples and tribes.

Unfortunately, our Indo-European civilization though remaining till present most advanced and most well preserved after series of global catastrophes, in the course of continuous expansion across all continents and constant antagonisms with external and internal

true and fanciful enemies, has lost not only political, linguistic and spiritual unity, but also correct understanding of the basic vedas, those sciences, which had backed up its power and superiority.

Paradoxically, the most widespread Indo-European language in the world now is English used by billion speakers in communication, research, trade and Internet. In fact, this language had been formed and developed on the basis of the vulgar Latin, lingua franca in multilingual Roman army. Then it was transformed by the Scandinavian influence, and lost almost all its inflections. The Great Vowel Shift (termed by the Danish linguist Otto Jespersen,) which is still in progress, caused the pronunciation in English to differ from that used in most other languages of Western Europe. It had lost long ago the system of cases and conformity of letter and sound. Everyone understands necessity of reforming the English spelling, though it will inevitably result in even greater rusticity of the language and greater break with etymology.

The increasing rate of technical progress in every possible way is strengthening the tendencies of reductionism consisting in reducing all complex phenomena to primitive schemes. This aggravates the break between the ancient syncretic scientific tradition and modern specialized science, as well as between the English-speaking world and cultures based on such SYNTHETIC languages as, for example, Sanskrit and Russian.

Understanding the secret scientific meaning and application of the most important ancient scientific books kept in constant phonetic, grammatical and logical form as a sacred heritage in memory of learned brāhmaṇas, most likely, since the seventh millennium B.C.E., had been lost not less than centuries ago, when Muslim invasion had fallen upon India and had stopped development of the civilization facing the information age.

When I started to investigate the Vedas, I soon discovered that the knowledge encoded in the Vedic mantras happened to get inaccessible to us by virtue of certain circumstances, such as considerable

degradation of the Vedic tradition, modern stereotypes, predominance of the European colonialist-haughty historical doctrine with inadequate mechanistic and mystical principles of interpretation and understanding of ancient texts.

But having got acquainted with these texts, I felt a strong confidence growing in the depth of my heart that sooner or later their true essence and its understanding would shine again as the sun. Then, a plan to restore the scientific outlook of the Indus Valley civilization began to ripen. My aim was to find and restore the synthesis of the methodology reflected in the Vedic scientific and philosophical commentaries, direct textual data, epigraphy and archeology. Their unity negated by the Western Indology is obvious to everyone who gets access to primary sources and does not hold aprioristic opinion. However, it is necessary to recognize that aprioristic judgments both of apologetic and nihilistic character prevail.

So, according to a known American Vedic scholar Prof. M. Witzel of Harvard University heading camp of critically minded Western scholars, the nature and origin of the Vedas is the focal issue of the recent 'revisionist rewriting' of ancient Indian history underlying much of contemporary Indian politics and at the same time of some section of academic Western scholarship. According to him, the issue has become increasingly politicized by pro-Indian researchers.

On the other hand, N. S. Rajaram and other nationalist Indologists accuse M. Witzel and his followers of the plot against India, partiality and adherence to inert views.

Yes, indeed, this debate reflects a complex situation in Indology, which has begun to change dramatically at the end of the XXth century. A huge amount of new archeological evidence and textual data accumulated during the XXth century insistently demand revision of many out-of-date scientific notions and stimulates changes in scholarly and political attitudes. The issue is becoming more complex, when the historical side is examined. It strikes by its exclusive

obscurity, ambiguousness and controversy. Truly speaking, it was initially politicized by early European missionaries, historians of the colonial period and Indologists themselves. And now, the clarification is deadly needed as discussion of the data without standard methodology provokes emotional exaggerations on both sides (see paragraphs on the West-European Indology.) It is extremely dangerous in the South-Asian political situation, where religions, whatever the term could imply, communalism and fundamentalism indissolubly connected to fanaticism and violence, have not the last role to play.

M. Witzel is apparently right saying that no one of the suggested theories of the origin of the Vedas withstands serious scientific criticism and insisting on that this debate, as in all the sciences, should simply be a question of evidence and proof. But this statement would be accurate only in that case, if M. Witzel himself was free from any biased opinions of his European predecessors of the colonial period, if there was a consensus in the domain of methodology, which is just absent, if all facts were covered, and all scholars really followed logic instead of emotions and personal sympathies.

Nevertheless, it is evident that modern European research methodology of these texts generated in the XIXth century has all negative characteristics of the naturalistic worldview, is rather far from being impartial, effective and firmly established. In most cases, researchers, just counter to common sense, perversely and arbitrary interpret the same facts, being guided only by their religious, political, philosophical and personal considerations. As a rule, they do not follow the internal logic of the texts, avoiding yogic process of 'synergetic experience' and 'empathy,' and select linguistic, textual, mythological, archeological, anthropological and other data, which are external to the main design of the texts, and use them for their own ideological and political purposes (instead of truly scientific reconstruction,) and then try to interpret them along the lines of their subjective, at times simply far-fetched theories.

Therefore, it is time to focus the research primarily and formally

on internal evidence and design of the Vedas. There is a necessity of thorough revision of the main approaches to the Vedic interpretation with a special attentiveness to the internal logic and the basic plan of the Vedas. Of chief importance, however, is not the critical scrutiny of the controversial and sometimes even internally incompatible philological, linguistic and mythological data selected without rhyme or reason with the purpose of a substantiation of a priori accepted methodology, but development and radical improvement of the methodology itself through inclusion into scholarly research work of fundamentally new still unexplored scientific information covering, wherever possible, all data accessible to science, including also probabilistic models of the reconstructed lost elements and – the main point – fundamentally new and yet not investigated facts, capable to stimulate development of more correct understanding of the subject.

This book is aimed at generalization of achievements in the domain of such integrated method development synthesizing the known facts and heuristic models. The results already got on its basis by our group ‘Sarasvatī’¹⁷ claim revolution in Vedic researches and have drawn attention of some leading Indian Sanskritists. The method, really, opens essentially new layers of scientific meaning in the Vedic texts and specifies a way of a more adequate description and understanding of the most ancient ‘sacred’ scientific texts of South Asia and the world.

The main tool of this new methodology is reconsideration of a huge array of precise mathematical data retrieved from the Vedas in consecutive perspective of theory of number, theory of sets, theory of coding and enciphering, programming, observational astronomy and synergetics, which were fixed in the most ancient Sanskrit math-

¹⁷ The name means ‘Speech;’ ‘Durgā, the Night, Wife of Śiva, the New Moon;’ an ‘excellent woman;’ the ‘Cow’ of the night sky; the ‘River’ of the zodiac; the ‘plant jyotiṣmati’ of the starry region; the ‘Wife of Brahman, the Full Moon or the Sun as the Creator of the Solar Universe.’

ematical and astronomical treatises, philosophical texts and Vedic Saṁhitās themselves.

We want also to throw light on a long discussed question of the origin and character of the Vedas and the ancient Indian exact science. On the basis of already accumulated data, I categorically reject the Eurocentric idea of a late origin of the Vedas and an alien influence of languages and culture of other regions of Eurasia, as well as the idea of a ‘folkloric character’ of these texts, which is supported by the majority of Western scholars.

Such approach is not only a blasphemy in the eyes of a Hindu being an expression of frank partiality and subjectivity, whereas it tries to ignore both traditional Vedic methods of interpretation and existence of a plenty of new evidence and theories showing that the Vedas have a uniform plan and had been conceived first of all as the integrated mathematical-astronomical multifaceted composition with several levels of the coded and symbolical meaning, as an original software of the mnemonic chronocomputer!

Some of the questions asked here and answered below are the following: 1. What is the true purport of the Vedas? 2. What should be the most suitable methodology for their decipherment and evaluation? 3. To which extent are all relevant data encompassed and their interpretation reliable and valid? 4. What kind of data and meanings remain absolutely ignored till present by the explorers? 5. What are the perspectives of the mathematical-astronomical Vedic decipherment? 6. In what sense had the Vedas anticipated modern mathematics, astronomy, physics and computer science?

The book presents our understanding of the basic model of the reconstructed Vedic chronometric recitation and its scientific utilization in chronometric ‘multimedia applications’ of the Vedic calendar ceremony.

The volume of texts and extracted data is enormous, therefore, we were to be extremely selective in their choice. The basic researched texts are evidently the Four Vedas, represented by a complex of

aphoristic, narrative, scientific and linguistic sources of different size and degree of intentional meaning. A range of epigraphic sources represented by Indus Valley seals and graffiti closely adjoins to them. Material documents, such as archeological findings and monuments of architecture have been somewhat encompassed also.

The major part of astronomical definitions of the Vedic gods has been selected from the text of the Ṛg-Veda, other Samhitās hugely depending on it were analyzed only now and then. A number of definitions has been taken from the Brāhmaṇas and the Upaniṣadas, and some part from the ‘Vedic Dictionary,’¹⁸ a repertoire of the Brāhmaṇical definitions of the major mythological astroterms.

An extensive ‘Introduction’ and Commentaries to the first book of my Russian translation of the Vālmīki’s Rāmāyaṇaṃ give a lot of new evidence of calendar-recitative character of the ancient Sanskrit epic poems. A brief analysis of the recitative chronometry of the Rāmāyaṇaṃ is included also in this book. Also there is a section concerning chronometry of the Mahābhārataṃ and the Bhagavadgītā (see the Second Part.)

The mythological material, logical structure and mathematical substructure of the Ṛg-Veda as major mytho-chronometric monument have been analyzed most carefully. Under a pressure of a huge quantity of new facts resulted from this analysis, we have been compelled to question a widespread stereotyped view dominating Russian, American, Indian and world Indology, according to which the Vedas represent compilations of hymns composed by nomadic peoples.

Thus, this book is an attempt of a deeper historical-mathematical and text-critical astronomical analysis of the Vedas carried out in tune with our earlier theory of recitative-chronometric function of the sacred text. It postulates presence of the complex multilevel scientific content in the Vedas, appearing as a kind of original coded digital Testament of the most ancient civilization.

¹⁸ Hansarāja evaṃ Bhagavadaddatta, Vaidik Koṣaḥ, Vārāṇasī, 1926. (Sanskrit).

This discovery of absolutely new method of interpretation forms an important turning point in scientific comprehension of the Vedic scriptures and the origins of civilization.

Thus, this book is a result not only of the successive researches of the last twenty years, but also of a certain polemic between supporters of objective scientific research and adherents of the inert Eurocentric methodology. It is devoted to the reconstruction of the basic model of the Vedic recitation, inherent in the ancient Vedic recitative-mnemonic calendar and a chronometric semantic-logical analog-digital computer. The book only casually touches upon highly spiritual and artistic aspects of the Vedic literatures, mathematical astronomy of the siddhāntas. It does not analyze subtleties of astrology, neither of the solemn Brāhmaṇical ritual, nor astronomical-calendar geometry of such Vedic texts as the Shulva-Sūtras... These and other aspects are enough fully covered by many other authors.

We do not claim the covering of all the details and contradictions connected to dating the Vedas, origination of the Vedic ritual and its procedures. However, we could find the data, important for exact astronomical dating and location of the Vedas and could solve this problem both within the framework of existing chronology, and in the new chronology of T. Fomenko.

At the same time, presence of serious blanks and gaps in Indian, Western, and Russian indology obliges us to consider principles of the Vedic interpretation more steadfastly and in more critical way, than it is usually done in popular and general-theoretical indological works.

Contemporary Vedic interpretation has emerged as a rather inconsistent and incongruous. A considerable part of important prescriptions was forgotten, some principles were interrupted in days of Mongolian domination and some other practices were essentially deformed during British colonial rule.

The Vedic tradition, for example, informs us about the existence in antiquity of 1130 schools of the Vedic recitation, which

were characterized by specific methods of teaching, performance and interpretation of one of the editions of the four Vedas. However, only 13 schools have been preserved (among which only seven in recitational tradition.) What were the other 1117 editions remains a riddle (about a possible solution see below.)

Inconsistent development of indology during the last two centuries and the abundance of theories and hypotheses of the origin of the Vedas quite often simply complicate matters, introducing a host of prejudiced opinions, Eurocentric notions, unchecked guesses, and even frankly groundless fabrications.

At the same time, translation of a significant part of Vedic scientific and philosophical texts into European languages, including Russian, discovery by Indian archeologists of the Indus Valley civilization and some successes of linguists in decoding its script create preconditions for more successful perusal and understanding of the Vedic texts.

Location and dating of the Vedas are the most important methodological conditions of correct interpretation of the Vedic texts, Indus epigraphy and reconstruction of the Vedic outlook of the Proto-Indian period.

New hermeneutics is aimed at a substantiation of principles of integrated research of the whole complex of mathematical-astrochronometrical data contained in the Vedas and adjoining texts. We aspire to prove, that the secret plan of the Vedas is hidden in artful designs of ancient observational astronomy, higher mathematics and chronoprogramming, which are main 'vital organs' of the Vedas (vedāṅgas) or Vedic scientific disciplines. They form an undividable block responsible for the correct chronometrical calendar functioning of the mathematical-linguistic operational system with a number of computing programs, represented by the Vedic Samhitās, Upaniṣadas, Itihāsas, Purāṇas and Tantras.

Our theory can look like one more eccentric attempt pretending to give an explanation to an inexplicable phenomenon. To move

along a slippery slope of the Vedic interpretation, where so much is disputable, and to try to find and endorse the scientific understanding of technology-intensive product of hoary antiquity, is a serious challenge. I am encouraged only by that some part of modern philosophers, historians and interpreters of the Vedas believe that there is a certain important latent meaning, which demands decoding.

Aspiring to reveal the secret of the Vedas and to restore the lost knowledge, I investigated all the four Vedas from every possible point of view, not trying to absolutize anyone of the methods and being open to recognition of any new idea. As a result of textual researches, computer calculations, interdisciplinary studies and long meditations in a quiet enlightenment, I have come to belief that the spiritual or moral dilemmas widely used in astronomical-calendar myths about gods are auxiliary methods based on idealization and sublimation of original dramatized models of human behavior, which had been applied in the Vedas to the description of movement of planets and markings of their complex configurations, which are difficult to grasp by means of ordinary language.

They should be interpreted as special astronomical terminology, scientific metaphors, stylistic or poetic methods developed for easier storing of long lists of the repeating monotonous astronomical phenomena and big calendar numbers. The exaggeration inherent in mythological-astronomical-mathematical metaphors is internally justified by a astronomical-mathematical context. Religious-philosophical ideas in organic synthesis with Sanskrit linguistics, literary tradition and philosophy, actually, expressed different branches of the ancient exact science, mainly, astronomy.

This statement is not axiomatic and requires an essential substantiation. As there is a strongly pronounced disagreement between two camps of indologists: camp of the ‘conservatives’ adhering to principles of a naturalistic explanation of history, and camp of the ‘revisionists’ aspiring to revise the postulates of ‘conservatives’ tooth and nail.

The former one is destined for being deceived by their arrogant position the latter one is cut out for being caught in the toils by the same token. You may easily stub your toe on this debate.

Many of the conclusions of my group are contrary to standard indological stereotypes and are not always axiomatic as among modern scientists there is no unanimity neither about a predominating role of astronomy, nor about presence of mathematical astronomy and higher mathematics in the Vedas, especially, of methods of programming similar to modern ones, in most ancient Saṁhitās and – the main thing – there exists a disagreement concerning character of the astronomical content and ways of its interpretation.

Unquestionably, our conclusions can seem revolutionary, and sometimes sinking in a huge actual material, which itself demands additional studying and decoding, but it would be inconsiderate on the part of any thoughtful reader to sweep aside these conclusions without special consideration as they are based on methodology of the exact sciences, on generalization of modern Vedic researches, and results are really sensational. It is a true discovery of the most ancient and most secret method of coding of the exact information. It is a decipherment of the digital will of the most ancient global civilization. This discovery should have fundamental ideological value for all humanitarian and exact sciences.

Surely, we have a certain chance to comprehend the lost meaning of the Vedas. The ancient transmigration out of India, in particular, has conditioned this possibility. The Vedic philosophy of science, which dominated in hoary antiquity in the South, East, North and West of Eurasia, define to a considerable extent the temper of modern Asiatic and European philosophical and scientific methodology. In addition, what is significant for our subject, its main scientific principles and goals were not completely forgotten. They were preserved in Sanskrit sūtras and, what is more, are present invisibly in the modern European and, consequently, the world science. Exactly this circumstance gives us confidence in that with the help of the

most advanced modern scientific methodology we shall be able to comprehend correctly the ancient Vedic philosophy of science.

It becomes, however, more and more evident that in reality the knowledge preserved in religious scriptures such as the Vedas represented not the abstract spirituality, nor superstitions, but the exact science par excellence, especially, for the prehistoric South Asians, though, today, it is associated mostly with enigmatic ‘mystic science.’ Fortunately, among some part of contemporary philosophers and historians, there is an abiding faith in an intrinsic hidden meaning of the Vedic texts, which defy straightforward approach, description and definition.

Our research is concerned with such a new method of hermeneutical interpretation, which promises to bring about a real revolution in Vedic Studies, disclose essentially new layers of meaning and open way to more adequate description and understanding of the original ‘sacred’ texts of early South Asia.

For the most part, it is a mathematical decipherment based on reanalysis of all mathematical data retrieved from the Vedas in the consecutive astronomical-calendrical perspective. It will pour new light on the much-debated question of the origin and character of the Vedas, which are regarded here as books really representing Science indigenous to early South Asia.

This book is addressed to those Indologists, who deal with the interpretation of the Vedic texts, ancient Indian culture, philosophy, religion and literature. The sensational results, which are offered in a dense form in the Second Part, undoubtedly, will be of interest not only for Vedic textual critics and historians. They would become a subject of a close examination for researchers of similar texts of other civilizations, for linguists, literary critics, philosophers and sociologists, for mathematicians, programmers and astronomers.

1. SCIENTIFIC AND PHILOSOPHICAL SUBSTRUCTURE OF HINDUISM

For composers of legal textbooks (Dharma-Śāstras) the Four Vedas (Sciences) represent initially one Integrated Science. It was called Śabda-Brahman, the Heavenly Word or Brahmā (that is the Sun, the Creator,) emanating as the Word or the Veda. The Veda is non-personal (apauruṣeya) being a creation of a Supermind mediated



Temple of the Lord Great Time

by many generations of wise men. It is immortal and non-perishable. The myth asserts that symbolical heavenly wise men (ṛṣis, personifications of the years) apprehended in the sky thanks to concentration (yoga-śakti) a wave of not audible sound, invested it with the Word (Śruti, 'Word', 'Veda') and spread it for the blessing of the world.

In our opinion, it is possible to draw from all this only one resonable conclusion that knowledge codified in the Vedic texts was received through scientific observation, which had been later codified by an Academy of Sciences.

In modern form, the vast collection of the Vedic compositions, which have embraced practically all major scientific disciplines, is one of the most majestic and perfect in the 'chronocosmic' genre.

The Veda with explanations is, actually, not one, but a system of some thousands works in different branches of knowledge, break-

ing up into 14-18 main and 64 minor subjects, which, however, are connected by the uniform philosophical methodology.

The elementary education was carried out at home with the Itihāsas and the Purāṇas as basic texts, which covered all branches of astronomical chronomythology. All material in these chronopems was in verse and was strung on chronomythological plot of the framed story.

The secondary education concentrated around 64 practical sciences, arts and crafts. The concept of 64 arts reflects the notion of a perfect month of 32 days and 64 kalās ('splinters,' that is, phases of the Moon,) to which 64 yoginīs or devīs (night goddesses) correspond. In the same way, 16 'mothers' (matṛkās) match up sixteen 'splinters' of the Moon.

64 arts as they were studied, for example, by a courtesan may be divided into the following groups:

- 1) Ethics;
- 2) Education of children;
- 3) Reading books;
- 4) Etymology (explanation of difficult words);
- 5) Versification and lexicography, eloquence and skill to finish the broken verse, competition in versification (bouts-rimés,) knowledge of rhapsody, knowledge of riddles;
- 6) Development of memory, immediate memorization and a skill to reproduce precisely everything heard;
- 7) Singing, play the psaltery, dancing, acting, dactylology, painting, playing on jal-tarang (vessels with water);
- 8) Knowledge of foreign languages;
- 9) Knowledge of local languages;
- 10) Doctoring with grasses;
- 11) Dramatic identification, cosmetics, ointments, hair washing and decorating with flowers, skill to make a frontal mark (tilak,) teeth and body coloring, preparation of perfumes and pink water;
- 12) Knowledge of clothes and ornaments;

- 13) Knowledge of jewels and their colors, proper selection of jewelry, knowledge of ear rings;
- 14) House decoration, bed preparation;
- 15) Floriculture;
- 16) Thrashing the rice;
- 17) Cooking, preparation of vegetables, cakes and drinks;
- 18) Weaving, weaving of wreaths, spinning;
- 19) Sewing, embroidery;
- 20) Carpentry, architecture;
- 21) Knowledge of ores and substances;
- 22) Science to win;
- 23) Fortunetelling, drawing astrological diagrams, change of consequences of an act;
- 24) Organization of shows, competitions of rams and cocks, oxen, parrots and starlings;
- 25) Gambling, dice play;
- 26) Deceit, sleight of hand, swindle.

At universities such as Takshashila, located in the North-West region of India, not only Indians but also students from as far as Babylonia, Greece, Syria, Arabia and China studied 68 different streams of knowledge. The minimum entrance age was 16 and the number of students at most prominent universities of the rank of Takshashila reached up to ten thousand.

It is known, that the system of the Vedic or ‘gymnosophistic’ (that is, yogic, as in Greece, yogis were called ‘nude wise gymnasts’) education served as a sample for the ancient Iranian and the ancient Greek musical-gymnastic encyclopedic education. In Greece, the system included also training in various disciplines of physical (sports) and intellectual culture (muses,) that is sciences, crafts and arts. Greek encyclopedic (enkyklios paideia, ‘circumambulation’) education apart from grammar, rhetoric (dialectics,) arithmetic, geometry, astronomy and the theory of music, included agronomics, doctoring, military art and philosophy (Plato.) This harmonious

system in turn became a model for Byzantine and Russian, Roman and West-European education. This pattern has preserved its value until our time.¹⁹ In this sense, all European culture is greatly indebted to the Vedic civilization.



¹⁹ Lexikon der Antike, Leipzig, (Dictionary of Antiquity. Moscow, 1992. Russian Tr.) P. 388-389.

2. VEDAS AS MNEMONIC ANALOGUE-DIGITAL CHRONO-COMPUTER

Exegi monumentum aere perennius.

(‘I have built a monument more stout than copper.’ Lat.)

Until now, vedologists have been studying the mundane language information present in Vedic mantras along the lines of the ordinary grammar, mythological and literary comparative analysis and profane dictionary. The main concern has been concentrated on translation of the Vedas into modern languages, classification of the myths, literary scenes, mantras and their interpretation. The obtained information was discussed primarily in the light of general philology, stylistics, philosophy, mythology, religion and history. There is no need to emphasize the relevance of all these efforts. As a Sanskrit proverb says, ‘A person reading Vedas without understanding of their sense is similar to an ass.’

However, confronted with strange archaic expressions, multiple grammar and stylistic irregularities, absence of narrative order, the first European Indologists quite often hurried to make a conclusion that the Vedas belong to a primitive past and are composed by nomadic tribes.

In the light of our mathematical-statistical, mathematical-probabilistic and computer-combinatory calculations, which have showed extreme accuracy of concurrences of hundreds Vedic numbers and their combinations with astronomical calendar constants, it has become obvious that former evaluations and interpretations of the Vedic literature based, mainly, on historical and philological methods have considerably become outdated and should be radically reformed.

The discovery of the digital encoding in the Vedic mantras demands adjusting vedology to the Vedic scientific hermeneutical tradition with the purpose to decrypt the major and most ancient stratum of spiritual-cultural heritage of humankind, which has come to us in an encoded form.

The analysis of the Vedas, of the ancient and modern Vedic exegetic literature has been leading us urgently to a conclusion that the R̥g-Veda as the most authoritative text of this most ancient scientific tradition must contain some astronomical and at the same time practically significant, first of all, calendar-astronomical meaning.

Analyzing the stratification and content of these texts, we were finding new and new proofs of the earlier reconstructed astronomical-chronometric scheme of their functioning. Soon, It has become clear that decoding of the Vedic gods' symbolism and chronometric principles of the ritual Vedic recitation are prerequisites of the correct view of the Vedic annual and monthly cyclic planetary computerized astronomy.

From 'Clock for counting' to a Computer

I am completely convinced that humankind nowadays is mastering programming with such ecstasy not because it is a completely new area of knowledge, but having rediscovered in it a part of its cultural heritage, its soul, once lost and now spontaneously restored to life.



G. Hawkins, who astronomically had investigated the purport of the Stonehenge, which had been built in the south of the Great Britain about 2 thousand B.C.E., also had come to this idea. With the help of computer, he had found out that the arches created from huge stone

blocks represented telescope-sights marking points of rising or setting of the Sun and the Moon in days of solstices. In addition, the construction was a kind of computer for prediction of eclipses. The Stonehenge, as well as Kallenish on the island Lewis (the northern Scotland) and hundreds others similar megalithic constructions, most likely, on his belief, were connected to the 56-year cycle of eclipses

consisting of two 19-year Meton cycles and one 18-year period. These are three cycles of lunar nodes, which have been also discovered by us in the structure of the Vedic mantras.

However, G. Hawkins believed that those periods were found only in the internal organization of the stone observatories, but knowledge, which formerly had underlaid their complex engineering design, had been irrevocably lost.

Surprising in these constructions is not only their grandness and calendar-astronomical accuracy, but also their location. As G. Hawkins writes: 'Both these constructions are located close to critical latitudes. Kallenish is at the latitude where the Moon sometimes as though touches the southern part of the horizon sliding along it. The Stonehenge is at latitude where the Sun and the Moon in their extreme positions on horizon ascend and set in the directions located under a right angle to each other. From the point of view of astronomical observation, the Stonehenge could not be built to the north of Oxford or to the south of Bournemouth. Only within the limits of this narrow belt of latitudes, four 'basic' stones form a rectangular. Outside of this zone, the form of the rectangular would be appreciably deformed. Probably, these latitudes were chosen meaningfully as builders knew that on more northern or southern latitudes, corners between 'basic' stones would be different. Stonehenge and Kallenish show that their builders, almost certainly, had knowledge of basic facts, which subsequently underlay exact navigation and resulted in discovery of sphericity of the Earth. But if they also had so valuable knowledge, they transferred them from generation to generation in an oral form: stones speak nothing about it.'²⁰

G. Hawkins expressed a deep concern about domination of ridiculous ideas of backwardness of the people of that period. He gave special emphasis to that, in the Great Britain, the druidic oral tradi-

²⁰Hawkins G. S. Stonehenge Decoded. L., 1966. (Russian Tr. Moscow, 1984.) P. 242.

tion, which could throw light on the secrets of scientific knowledge of builders of megaliths, had died for a long time.

Though the continuity of astronomical rituals in India also has been essentially broken, nevertheless, the transmitting of the basic oral texts, which, on my belief, contain explanation of the mysterious astronomical constructions of antiquity, has been preserved. In the subsequent chapters, you will find a reconstruction of the Vedic daily chronometry, mathematical astronomy, coordinating periods and calendar paleography, giving numerous confirmations of the fact that builders of the most ancient observatories like the Stonehenge maṇḍala were representatives of the Indian civilization. They had in their disposal all the set of Natural and Human sciences and the universal ethics, which endowed them with the high sense of responsibility for all living beings and ecology seeing in humanity one family.

Digital and Analog Computers

The discovery of various methods of composing the Vedic poems-tables and various methods of encoding digital information in them has forced us to consider some issues of the history of mathematics, programming and invention of computer in wider philosophical and historical perspective.

It is known, that computers can be digital or analog. Digital one is processing binary numbers '0' and '1'. Analog one works with digital values having a continuous range. Analog numbers are both '0' and '1,' and '1.5' or number like 'approximately 3.14.' A desk lamp can serve as an example. If it has simple switch ON/OFF, it represents a digital device. If the switch is replaced with a smooth regulator of luminosity, then the lamp becomes the analog device, as the quantity of light can be changed continuously from zero up to a maximum.

It is usually considered, that analog computer systems were the first mastered type. Thus, the Western encyclopedias and directories

impose an idea that the era of computer development began in Europe in 1623 from the analog machine of German scientist Wilhelm Schikard using 11 full and 6 incomplete chain wheels, which could add and, with the help of logarithmic tables, multiply and divide.

Certainly, this invention had been preceded by many centuries of development of such disciplines as mathematics, physics and mechanics, with quite probable presence of programming, formal logic and structural linguistics.

Development of logic and time reckoning devices was carried out since ancient times in Greece and then continued in medieval Europe.

One of early European logic devices was ‘the logic machine’ of a Spanish theologian and philosopher Raimund Lully (c. 1235 – c. 1315,) author of the ‘Doctor Illuminatus.’

The French philosopher, the mathematician and physicist Blaise Pascal (1623 – 1662) invented in 1642 a machine for addition and subtraction, automatically carrying figures from a column into a column.

The popular analog computer used during the 20th century was a slide rule. Calculations on it were carried out with the help of the narrow wooden strip sliding in the middle of the ruler. As sliding here is continuous and there is no mechanism for fixing values, the slide rule is the analog device. New interest to analog computers has woken up in connection with studying of nervous networks, which react to continuous electric signals. Modern computers, nevertheless, in the majority are digital machines.

The first computers of modern type had appeared in the thirtieth-fortieth years of the last century during the work on perfection and automation of complex calculations. In 1932, Vannevar Bush (1890–1974, U.S. electrical engineer, education and research administrator) had created mechanical analog differential analyzer. Then in the USA and Germany, the electromechanical computer using a binary code was invented.

The first electronic digital computer working on a binary code and using mathematical logic had been created in 1937–1942 by the American physicist of the Irish-Bulgarian origin John Vincent Atanasoff (1903–1995.) His ideas had been stolen and used in the electronic-digital integrator and computer (ENIAC – Electronic Numerical Integrator and Computer,) which till 1971 was considered as the first electronic computer, while during judicial suit between two companies on completely other issue priority of Atanasoff casually was found out.

Device of Atanasoff in 1000 times was more exact than the Bush’s mechanical analog differential analyzer. In addition, this accuracy could be easily increased up to any quantity of digits, while in an analog computer, for example, in order to increase 10 times the accuracy of measurements of a ruler, it is necessary to increase the ruler corresponding quantity of times.

However, electronic digital computer began to be applied in computer science widely only in the second half of the last century since the fiftieth years, when the computer, operating 20-digit, then 39-digit and 45-digit numbers have appeared in different countries. In 1961, the first integrated circuits were invented, and then in 1971, ‘Intel’ created the first microprocessor, the programmed logic device working on the basis of technology of big microchip, which used originally 4-8-digit codes, then, since the third generation of PC 80286, 16-digit, since the middle of the 90-th, when processors ‘Pentium’ appeared, 32-digit, and from the beginning of 21st century 64-digit codes.

Vedic computer

Now, when the true digital assignment of the binary code of Piṅgala is quite understandable in application to the Vedic mantras, I can affirm that K. P. Rajappan seems to have been very reserved evincing an important prophetic vision that the Vedic mathematics in combination with grammatical theory of Pāṇini reminding the theory

of ‘semantic networks eliminating syntax,’ Vedic epistemology of Śankara, symbolical or formal logic navya-nyāya, which outstripped Europe in development of mathematical logic, really, created methodological base for invention of an Electronic computer.

According to K. P. Rajappan, a Sanskrit text ‘Dhvant-Pramaka-Yantra’ testifies that in Middle Ages in India, even the theory of electricity allegedly had been developed and ways of its manufacture and storage had been studied. These researches had outstripped the corresponding European discoveries by some centuries. The concept of electron was accepted in the European science only at the end of the XIXth c. For example, K. Marx in the middle of that century still heard nothing about the electromagnetic theory of the English physicist and chemist Michael Faraday (1791–1867) and the Scottish physicist James Clerk Maxwell (1831–1879,) who had discovered electromagnetic induction.

The Electronic computer, it is true, could not appear several centuries ago in India by virtue of Muslim invasion and destruction of the very foundations of the Sanskrit information age civilization...

However, it does not at all belittle merits of much earlier ancient Indian scientific discoveries in the field of ‘brain computer’ and in the adjacent areas of artificial programming language, theory of sets, combination theory, fast mental calculations, binary, ternary and decimal coding, encryption, formal logic, algebraic phonetics and grammar of the artificial language.

Ancient Indians developed exclusive recitational techniques for the Vedic mathematical-linguistic chronotexts using them as analogue chronodevices. These techniques with psychology of yoga-vedānta of prolonged concentrated Vedic recitation in aggregate represented a Vedic bio-computer technology of precise mental mathematical-astronomical analogue calculations.

They used also alphanumeric, verbal-digital, binary and ternary codes in the corresponding digital data-base computer programs ‘installed’ into the operational system represented by the ‘sacred

Vedic texts.’ The precise functioning of the codes was regulated by ritualistic, metric, grammatical, phonetic, etymological and astronomical sūtras or metarules.

Though for the time being we have not deciphered the entire array of the Vedic binary mantra-numbers and do not know their concrete application in astronomical measurements, we have formulated a number of sound hypothesis of the astronomical-mathematical interpretation of the Vedas and are fully persuaded that the Vedic mathematics with clear outlines of a metatheory of numeration, binary and decimal calculus, ideal scales of measurements, developed combinatorics, algebra, geometry, quite probable presence of methods of fast calculation similar to those reconstructed by Krishnatirtha and theory of sets preserved by Jainas (vide infra,) indeed, had everything for exact astronomical observations.

Doubtlessly, the successful perusal of the Vedic supercode depends directly on exact interpretation of the planetary calendar constructed on principles of the ‘isomorphism,’ mythological polysymbolism and observational astronomy. The first steps have been made: the conversion of a huge massif of mantras into numbers and their laborious analysis is necessary. Then a careful study of the hypothesis of the mathematical-astronomical function of the Vedas along the lines of the calendar-chronometric theory and observational astronomy is required. The final theory of the reconstructed Vedic mnemonic supercomputer must reveal its dynamical functioning in time and logical integration with observational astronomy and calendar.

3. 'THE VITALS OF THE VEDAS' (VEDANGAS) AS CLUES TO PUZZLES OF CHRONOCOMPUTER

The metrics are two legs of the Veda, the riveting of ceremonies are two hands, the science about movement of the stars is its eyes, the etymology is its ears, the phonetics is its nose, and the grammar is its mouth.

Pāṇinīya-śikṣa-sūtra, 41-42.

The Vedāṅgas (lit. the 'vital organs of the Vedas') form the main category of the Vedic scientific literature, which was developed in pre-Vedic times. They formulate the principles, according to which the Vedic literature was composed. But the most ancient manuals of these disciplines, which have come down to us, might have been written, supposedly, in the middle of the first millennium B.C.E.

The vedāṅgas include six treatises of brief rules in the sūtra (stenographic and ciphered) form: the science of ritual (kalpa,) phonetics (śikṣā,) grammar (vyākaraṇam,) etymology (nirukta,) metrics (chandas) and astronomy (jyotiṣa.) Their function is correct understanding and performance of the Vedic programming texts.

According to Bhartr̥hari, a famous Indian grammarian, supposedly, of the sixth-seventh century C.E., the vedas are not created, nonperishable, and inherent in the substance or the first cause of the universe. They are manifestation and way of realizing Brahma (Great Speech or Symbolical Expression, Great Essence, Great Lord of Time and Universe.) The different scientific disciplines, sources of knowledge and refined education, are the main and minor subdivisions of the integral Veda as the creator of all the worlds.

The techniques of preservation in memory in the constant form of the extensive Vedic literature as well as a system of interpretation of the Vedic songs with the help of a host of philosophical and exact sciences which, undoubtedly, contain many concepts with extremely interesting scientific potential (logic, grammar, medicine, astronomy, mathematics, poetics, aesthetics, psychology, unified field physics,

synergetics, systematics etc., etc.,) clearly specify a huge practical value of the Vedas.

All the disciplines disclose their connection with computerized procedures of the astronomical observation and chronocalculation.

However, refinement of their style, mathematical virtuosity of the Vedic poetry, quantity of the scientific texts and depth of their scientific ideas are an obstacle for everyone who dares to try at his or her own risk to understand the secret sense of the Vedas. As all prospects of recovery of the genuine Vedic tradition have vanished, perhaps, only a strict analysis of the Vedic auxiliary scientific treatises remains as an important instrument of a correct Vedic interpretation.

Mnemonic (Smṛti) works were represented by 'textbooks or sciences' (śāstras – from the root 'to teach; to edify,') which embraced the branches of special theoretical knowledge divided into five categories: pratiśākhyas ('editorial commentaries,') upavedas ('auxiliary sciences,') vedāṅgas (vitals or the highest sciences,') darśanas ('philosophical outlooks') and vidyās ('applied sciences.')

The second important class of the Vedic auxiliary texts is represented by upavedas including such disciplines as āyur-veda ('medicine,') dhanur-veda ('military science,') gandharva-veda ('music,') bharata-naṭya-śāstra ('theatrical science') and sthapatya-śāstra-veda or śilpa-śāstra ('science of sculpturing and architecture.')

All of them participated in a different degree in programming the Vedic socio-chrono-cosmos.

The language of the vedāṅgas as well as the other Vedic auxiliary scientific literature, is extremely laconical and reminds dry instructions about what is necessary to do, and does not contain theorems and their proofs. Moreover, the statement is frequently coded, and keys to codes are hidden deep inside either texts or tradition. This style is inherent in the 'science of coding' (chandaḥ-śāstra,) in the 'analytics of language or grammar' of Pāṇini, and to 'rules of measurements with the help of a rope' (śulva-sūtra,) giving instructions about geometrical calculations and designing brick memorials-altars

of a complex configuration.

Obviously, the Vedic methodology and training were based on skills to operate with attributes of a class of similar objects and, in particular, to classify them effectively to code any decimal numbers with the help of binary metrics (Piṅgala,) to generate any astronomical terms from roots of ordinary language (Yāska) and grammatically correct ordinary statements containing strict mathematical implied sense from strings of binary numbers (Pāṇini,) and also to create any geometrical designs necessary for astronomers with building materials of any configuration. As Pierre-Sylvain Filliozat remarks, this methodology was born in close interaction of linguistics and mathematics and has been aimed at creative application of methods in practice, instead of scholastic theorizing.²¹

The integrated approach to the Vedic auxiliary disciplines demands remodeling of the traditional approaches to the Vedas and, in general, to the Sanskrit computerized literature, cosmic ethics, computer science, global education and civilization. Besides, this method can appear useful in the long dispute concerning elaboration and acceptance of a universal eternal calendar, development of new programming codes and multimedia calendar programs.

Due to efforts of researchers during the last decade, these Vedic disciplines have unexpectedly appeared completely in other quality – not as philological, but as mathematical-programmer aids of correct functioning of the Vedic Saṁhitās. They describe in full detail the codes and ciphers used in the Vedas. Every vital science is responsible for a set of codes. We cannot say definitely, what their total number was. The codes described in this research embrace a dozen of variations as if every vedāṅga produced two codes or ciphers.

²¹ Pierre-Sylvain Filliozat, 'Sanskrit Linguistics and Mathematics in Ancient India'. In: Indian Horizons, Vol. 44, Number 4, Special Issue: Sanskrit Literature, New Delhi, 1995, p. 39-50.

4. TRADITIONAL MODES OF VEDIC EXEGESIS

The history of Vedic interpretation, regardless 200 years steady development and abundance of theories and hypothesis is still looking for an explanation of crucial questions. 1) What is the Veda? 2) What is the proper reconstruction of the Vedic worldview? 3) How to correlate the vast literary data of the Vedas with the growing archaeological material? 4) What is the correct dating of the Vedas?

A system of methods of Vedic interpretation including seven basic ways of explanation of the latent sense was already formed in ancient times.²² They are more or less adequately adopted in modern Vedic studies.

They are:

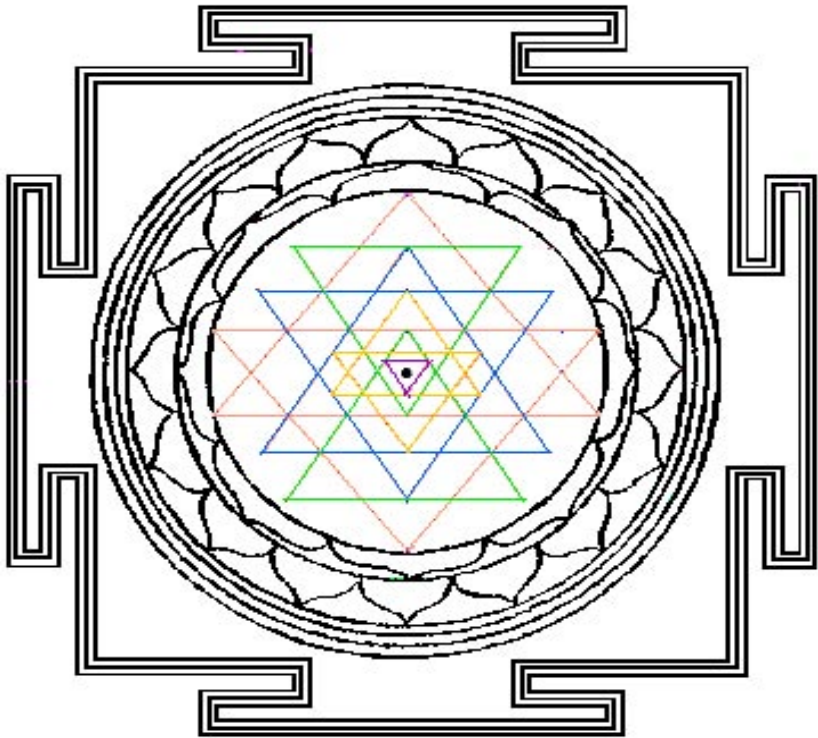
1. mythological or pseudo-historical (aitihāsika;)
2. ethical-psychological (adhyātmika;)
3. ritualistic (yajñika;)
4. traditionalistic or phonetic (sampradāyika;)
5. grammatical (vaiyākaraṇa;)
6. semiotic-etymological (nairukta;)
7. astronomical (jyautiṣa or pūrvayajñika.)

As it is obvious, the methods roughly coincide with the Vedāṅgas and the Darśanas including philosophic and mythological interpretations. The philosophic (ethical-psychological) one is based on the Darśanas and mythological (pseudo-historical) one is based on the Itihāsas.

According to Bhartṛhari, various scientific subjects, sources of knowledge and refined education, are the basic and minor divisions of the integral Veda as creator of all the worlds.

²² R. Gopal, *The History and Principles of the Vedic Interpretation*, Delhi, 1988.

This book is an attempt to propound a coherent theory of the time study in the Vedas and to elucidate the main issues of the Vedic interpretation in the light of strong criticism of European methodology as opposed to the integrated principles of ancient exegesis.



Shri Yantra

5. PSEUDO-HISTORICAL (AITHASIKA) INTERPRETATION

Until recently scientific interpretation of the Vedas has been dominated by philological and religious approaches, which gravitated to two extremes: mysticism and historical naturalism.

A part of Indologists (W. Jones, M. Müller, H. H. Wilson) be-



A. I. Kuinji, Dnepre in the night

lieved in the historicity of the Vedic texts. However, others (A. L. Basham, S. Piggott, M. Wheeler, L. Wooley, and the majority of the Indian scholars) are skeptical.

Pseudo-historical mode of Vedic interpretation is based on the translations of the Vedas into modern languages and reinterpretation their mythological narrations. It regards the Vedas as mainly source books of social history.

The significance of modern translations, whatever be their exactness, lies deep in the province of such auxiliary Vedic sciences as grammar, etymology and lexicology. Useless to say that ‘word-processing,’ ignoring the startling and specific Vedic concepts of Time, Universe, Energy, Number, Word, Thought, Action, etc. formulated in the Vedāngic and Upavedic literature is only of preliminary significance and can only stimulate mythological hypotheses of ‘ontological’ or descriptive, static character (meteorological, solar, lunar, astral, ethnological and even biological orientation.) But these assumptions, extraneous to the Vedic tradition and developed outside the Sanskrit exegesis based on sophisticated theories of *pratik bhāṣa* (terminology and symbolism,) *dhvani* (hidden meaning or suggested sense,) *rasa* (aesthetics, pathos,) *alaṅkāra* (figures of speech) and *aucitya* (propriety, congruity or fitness of textual means) can not rationalize the essentially dynamic nature of the monuments.

To my mind, the *saṁhitās* were designed like intellectual integrated circuit chips or large astronomical tables. To look in them for social events of the Indo-European history seems very likely to be the same as, for example, to apprehend the D. I. Mendeleev’s Periodic table of chemical elements not in terms of corpuscular-wavy theory of quantum physics but through the medium of clashes of the Russian history.

The descriptive approach is deeply rooted in the doctrine of naturalism and non-synergistic, discrete historical evolution, which is altogether irrelevant and inapplicable in the domain of cultural history, especially, in the highly spiritual Vedic and Vedantic context. The consequence of this approach is the widespread treatment of the Vedic literature as an amalgamation of ambiguous songs by different authors of uncertain period.

Of the same value is the Marxist vulgar-mechanistic theory of the Asian way of manufacture, which Marx had formed a rather vague if not totally wrong notion of, leaning on the English colonialist concept of the Indian history, which spoke nothing about several

thousand years of Vedic India. He affirmed that the main formations could not be differentiated in India and a spiritual heritage represented an archaic ideology with all attributes of primitiveness and patriarchal character.

The other competitive speculation is due to Eric von Denniken about alien origin of the Vedic and other similar civilizations (he has produced several dozens of books on this theme, arranged many international conferences and founded a grandiose museum in Switzerland collecting architectural and other terrestrial proofs of the ancient space contacts.)

But the most wide-spread is the racist pseudo-historical theory of an Aryan intrusion according to which the Indian Ārias ('educated,') noble celestials, surrounding of the Moon, were the nomads-savages who had come to India from the outside, but... miraculously preserved for us the 'Vedic' knowledge 'stolen' from the enslaved Dravidians or, maybe, some other people.

Well-known American Vedic scholar David Frawley reconstructing the early stages of the Proto-Indian civilization, sharply criticizes the theory of Aryan invasion of India.²³ He emphasizes its racist character directed on split of peoples of India with the purpose of their colonial subjugation. He has generalized the argumentation, proving that the richest scientific and literary Vedic tradition was created in bowels of the greatest state of the ancient world, Proto-Indian civilization. According to his astronomical evaluation based on the data of modern archeology, this civilization, and, hence, the Vedas, start to be formed already since the 7th millennium B.C.E. (that coincides with my own astronomical estimation with that only difference that I consider the 7th millennium B.C.E. not the beginning but the culmination of the epoch of the great Vedic synthesis.) He is persuaded that the Vedic civilization was the basis of culture and civilization of all advanced peoples!

²³ D. Frawley, *Gods, Sages and Kings: Vedic Secrets of Ancient Civilization*, Delhi, 1999 (First Ed. 1993.) Pp. 15-18, 198, 254-257.

Similar views are characteristic not only of historical and cultural studies of Subhash Kak, Michel Danino, Conrad Elst and some others, but also for many archeologists engaged in research of the Proto-Indian civilization. The voices advocating a revision of Western stereotypes are heard more often and distinctively.²⁴

Vedic paradoxes and discrepancies can be removed as well, but only on condition that the Vedic vocabulary is treated not as a product of a bizarre naturalistic description but as a kit of calendrical terminology.

The Itihāsas and the Purāṇas

These are great mythological poems, in which the astral and lunar myths are used as a connecting frame for an exposition of the scientific, philosophical and artistic disciplines. This peculiarity transforms them into the original encyclopaedias of Hinduism.

The Purāṇas expound chrono-cosmogonic myths and describe within their framework the ritual, temples and places of pilgrimage. The astronomical, philological, philosophical, ethical, legal, Human and other sciences are presented according to the calendar time pattern, age and social status.

These works had been created during a very large historical time by Brahmanical academies, but they are attributed to two divine symbolical authors – Vyāsa (‘Diameter of a Circle, Editor, Divider of the Vedas’,) and Vālmīki (the ‘ant hill’, the Sun or the full Moon, the Creator or the Author.)

²⁴ Richard W. Lariviere, ‘Protestants, Orientalists, and Brahmanas: Reconstructing Indian Social History,’ 1994 Gonda Lecture, Gonda Foundation, Netherlands, 1994 (internet publication.)

Veda-Vyāsa



Vyāsa is a personification of the New Moon, nicknamed Kṛṣṇa Dvaipāyana (‘Black Islander’.) He is a symbolical editor of the Vedas, the Mahābhārata (accordingly the Bhagavad-Gītā,) the 18 Purāṇas and the Vedānta-sūtra, that is, of all the basic texts of the Vedānta. The symbolical role of his name consists in that it emphasizes the interconnection of the Vedic tradition with the observational mathematical astronomy.

The Bhagavad-Gītā

The ‘Bhagavad-Gītā’ is the finest, possibly, unique originally philosophical song, existing in any known language.’

V. Humboldt

The Bhagavad-Gītā is one of the most popular philosophical songs of the Mahābhārata, in which the ethics of a kṣatriya (warrior) is outlined. This ethics comprises the teaching about the three methods (yogas) or paths (mārgas) of attainment of self-identification with the highest spirit. Karma-yoga (the ‘method of action’) is the identification by means of disinterested actions and renouncement of their fruits. Jñānayoga is a realisation of the self-identification with Brahman by means of Vedantic knowledge. Bhaktiyoga is the self-identification achieved by means of love and reverence.

Kṛṣṇa (personification of the dark fortnight) announces these three yogas to Arjuna (an embodiment of Indra, the full moon of the constellation Arjunī or Phalgunī) on the eve of the great calendrical ‘battle’ between solar and lunar days, as the full moon night in the Moon of Phālguna, according to Brāhmaṇas, was the first night of the year.²⁵ The end of this struggle was predestined and known in

²⁵ B. G. Tilak, *Orion or Researches into the Antiquity of the Vedas*, Poona (4th ed.), 1955. Pp. 69–70.

advance. It follows that the ethics propounded by Kṛṣṇa was based on the idea of harmonising the efforts of a man with natural laws.

Chronometric value of the Bhagavad-Gītā will be examined in the chapter about the chronometric code.

Vālmīki

Vālmīki, the first kavi (‘author, poet,’) personification of the full moon and, accordingly, of the dark fortnight, is a symbolical author of the Rāmāyaṇa, a great mythological poem, which various versions taken together make about a million of stanzas and ten times exceed the volume of the Mahābhārata. The Rāmāyaṇa is considered as a standard primary poem expounding the highest ethical norms.

The Birth of Western Indology

Indian science, philosophy and literature had influenced and continue to influence the world culture both via translations of Sanskrit works, and researches of Indologists. In Europe, Indology as a discipline concerning India and its culture and Vedology as its basic branch studying the Vedas, their language, symbolism, historical and cultural content, have been formed during the last two centuries.

They have a lot of brilliant achievements to their credit, which have considerably expanded our knowledge about the culture of peoples of Southern Asia and allowed to examine our own history and philosophy under completely different angle. Western scholars have done colossal work collecting, editing and translating Sanskrit manuscripts. Discovery of the Sanskrit language by Europeans and its relationship with the main European languages has resulted in birth of Comparative Linguistics and Indo-European Studies. To list all remarkable works in this area is not obviously possible: suffice to mention only several most considerable achievements.

Henry T. Colebrooke (1765 – 1837,) chairman of the East-Indian Company in 1769 and of the Asian Society of Bengal and the founder

of the Royal Asian Society, has left the whole library of works on history of all basic sciences in India: law, algebra, astronomy, lexicography and Sanskrit grammar, the Vedic literature and philosophy, geology and botany.

A series of books on religions of the East was issued by Friedrich Max Müller (1823 – 1990,) perhaps, the most known Indologist of the XIXth century (vide infra.) Theodor Aufrecht (1822 – 1907,) the native of Silesia, has prepared a catalogue of Sanskrit works, which up to the middle of the XXth century had remained the most solid work in this area. Maurice Bloomfield (1855 – 1928,) American Vedologist originating from Germany, created a Concordance of the Vedic mantras and carried out a translation of the Atharva-Veda. Monier Monier-Williams edited a remarkable Sanskrit-English dictionary covering 180 thousand words. George Grierson (1851 – 1941) edited the 19-volume ‘Linguistic Survey of India.’

Thanks to efforts of Arthur Burnell, Johann Georg Bühler (1837 – 1898) and others, big collections of Sanskrit manuscripts had been collected, and whole areas of Sanskrit literature, which had been hardly known, appeared to light and were described. G. Bühler found manuscripts of the polymath Kṣemendra (XI c.) and the remarkable historian Kalḥaṇa (XII c.) He also composed the Encyclopedia of Indo-Aryan researches, textbooks of Sanskrit, Indian Paleography, Indian Law and founded an Institute of Oriental Studies in Vienna.

In 1843-56, Commendatore G. Gorresio (1808 – 1891) made the first translation of the Vālmīki’s Rāmāyaṇam into a European language. Then other translations of the Rāmāyaṇam, the Mahābhārataṃ, Purāṇas and other ‘great mythopoems’ (Mahākāvya) followed creating a furore in minds of the Europeans.

W. D. Whitney edited and translated the Atharva-Veda into English. Ralph Griffith (1826 – 1906) made translation of the hymns of the Ṛg-Veda, the Yajur-Veda and the Rāmāyaṇam. K. F. Geldner did a German translation of the Ṛg-Veda considered the most authoritative. The same was also repeated by a German mathematician German G.

Grassman (1809 – 1877,) who is more known as the author of the 2-volume Dictionary of the Ṛg-Veda. A French scholar Louis Renou (1896 – 1966) also left a number of translations of the select Ṛgvedic hymns, and a series of works on history of Sanskrit literature.

The Vedas were in focus of interest as historical or literary sources of many eminent researchers (G. Oldenberg, A. Hillebrandt, A. B. Keith, K. R. Pischel, A. A. Macdonell, T. Burrow, J. Filiozat.)

J. J. Woodroff (1865 – 1936,) better known under a pseudonym Arthur Avalon, who served as a judge in India and then taught Indian Law in Oxford (1865-1936,) acquainted the Western world with highly spiritual philosophy of Tantras, which were till then severely accepted in Christian Europe. In Holland, Jan Gonda (b. 1905) published Brahmānda-Pūraṇa and a number of other important texts and researches on Viṣṇuism and Śivaism. A lot of works on Buddhism, Jainism and Hinduism, Indian philosophy and, in particular, philosophy of Vāsiṣṭha-Rāmāyaṇaṃ being a voluminous treatise on Vedānta (considered as an appendix to Vālmīki's Rāmāyaṇaṃ) left Helmut von Glasenapp (b. 1891.)

Our knowledge of Indian history and its cultural heritage have considerably extended due to these talented works. However, the bulk of dark spots has hardly shrunk. The more the research material was growing and more distinctive were majestic contours of an original civilization the more fierce were disputes between representatives of different currents of European philosophy and historiography, in which the extremely unattractive means were quite often used having amplified the delimitation, generating constant struggle and conflict of ideas.

Despite of all obvious achievements of Indology in the East and the West of Europe the wide gaps in our knowledge of Indian history still prevail.

Russian Indology was for many centuries constrained by obstacles put in its way by Tartars and later by Englishmen, which almost excluded direct contacts with India established only after

Indian Independence. But even then, they were perverted or inhibited by materialistic ideological stereotypes. Externally quite respectable Western Indology, which, on the contrary, developed in conditions of direct contacts with its object and was constantly encouraged by colonialist ambitions of the European governors, had such serious moral deficiencies and distortions of opinions and facts, that its arguments are also internally invalid caught up in a vicious circle of racial prejudice and discrimination.

As Ronald Inden asserts in his book 'India Created In Imagination,' Western Indology has formed convenient for the Western colonizers, but completely wrong image of India, with the help of which it tried to deprive India of its political will, to hide its role in the world history. Edward Sad in his book 'Orientalism' (1978) also emphasizes that the Western history of the East has been called to serve colonial imperialistic interests of Europeans and was simplistic, superficial or simply hostile.

Richard Lariviere analyzing tendencies in modern Indology comes to conviction that modern Indological researches have not enough precision and correctness, which are inherent in works on ancient Greek and Roman history and philology. Though... even that correctness is at times challenged. In most cases, Western hermeneutics follows the same rules of unjust unilateral criticism, stereotyped generalization and direct distortion, denying or hushing up obvious facts.

A view is imposed to Indians that their history was always dominated by spiritualism, and there was no feeling of real life.

Not without distortion of facts, it is affirmed that Sanskritology has resulted in dehumanization of the Jews, Gypsies and other minorities in Nazi Germany, that Sanskrit philology cannot do without categories of the European linguistics, philology and history, and so on and so forth.

Objecting such partiality, Lariviere notes serious discrepancies between different methodologies in European historical science,

Vedic textual criticism and hermeneutics. For example, Europeans reconstructed the ancient social history of India with the help of the Dharma-Śāstras ('constitutions,' textbooks or codes of the state law, religion, pedagogy and ethics,) not having investigated them properly. So, the text of the Manu-smṛti (the 'Instructions of Manu,') which served as one of the foundations of British jurisprudence and was translated in many languages, have been never scientifically critically edited. But it is known that the text contains a great variety of discrepancies, later amendments and disputable passages, the chronology of the body of dharma-śāstra texts is not established and, hence, they are not put in a historical context.

Moreover, decadent theories have even appeared in Europe, such as deconstructivism, according to which there is no necessity to learn anything, as correct knowledge alongside with correct mutual understanding between the author and the reader simply are not possible.

If, in recent times, there is a certain sympathy among intellectuals to Buddhism, Yoga and even tolerance to Tantrism, in the XIXth century for Europeans, the debt of honour consisted in aiming scoffs at spirituality of India, to deride yogis and tantrikas, even to deny existence of the Indian philosophy and culture.

I can frankly say, that the West-European aplomb always shocked and revolted me not less than the Marxist historical materialism in my own country, which pretended to be of scientific and dialectical character, but in practice constructed its mechanistic theories on the unsteady basis of 'scrappy' historical chronology, in which there were a lot of bottlenecks and dark spots. Therefore, the explanation of how this chronology was generated, found by a Russian mathematician T. Fomenko, a Member of the Russian Academy of Sciences, was a pleasant refreshing shower.

According to Fomenko's New Global Chronology, developed in a frame of mathematical statistics and astronomy, the history of Europe nowadays suddenly has become much more logical and...

shorter than at school and university textbooks, being stacked hardly more, than in one millennium. And it eliminates many absurdities and dark spots in the world history.

In T. Fomenko's view, a French scholar Josuf Justus Scaliger (1540 – 1609) and Dionisius Petitius had created in the XVIth century a Eurocentric model of the ancient world history, which all historians, archeologists and politicians consider the scientific basis for the modern study of the ancient history until now. The monks had elaborated their theory using some messy tautological medieval chronicles and kings lists, related to three-four precedent centuries, having accepted them for original chronicles of the different ancient periods and quadrupled Middle Ages contaminating names and historical situations.

That mistake generated numerous phantom reflections of the European Middle Ages in the previous history, having created notions of an early, middle and late antiquity. It was Scaliger who laid foundation for textual analysis of the classics with his editions of numerous Latin authors. In opinion of T. Fomenko, a set of fakes of 'antique' texts and other documents followed. And all this, most likely, was done not without intention, and so to say in 'sacred' zeal for proving at any cost more remote antiquity of the West-European civilization and justifying the claim for conquest of the civilized world by semicivilized peoples.

With the same purpose and in the same period, the mythological Biblical view of the world described in the so-called 'Books of Kings' was developed and submitted anonymously as a history from the very start or the 'creation of the world.' Actually, according to the views of T. Fomenko, it had been copied from the Scaliger's medieval history of Europe with some paraphrases and distortions of names.

It is necessary to notice that even in days of Scaliger, there were skeptics doubting his chronology, among whom we find Sir Isaac Newton, who was also engaged in chronology study. Moreover, this dispute on chronology has not died out. Let's remember the famous

English philosopher and historian R. J. Collingwood, who was sure that each historian creates his own history, or Russian scientist N. A. Morozov, who questioned biblical chronology on the basis of his analysis of the astronomical information collected from biblical myths.

As it had been established by N. A. Morozov and has been confirmed by T. Fomenko, the biblical history had begun not at all in Palestine, but in Italy as revolt of slaves, worshippers of a volcano Vesuvius and, accordingly, a Fiery Fiend and Spirit of Destruction, which 'had inspired' them to enthrallment of all civilized peoples of the Earth.

It may seem paradoxical, but the canopy of Christianity has sheltered a number of unhuman movements such as medieval witch-hunter scholasticism, which has been shatteringly discredited by the pen of the late ethical writer Leo Tolstoy in his 'Criticism of Dogmatic Theology,' the fanaticism of the numerous sects, which have assigned to Middle Ages a label 'the Dark Ages,' and witch-hunt in the widest sense, including the modern political prosecution of any heterodoxy in the countries of the so-called Christian atheistic world.

As it has been just seen on the Moscow's Open World TV channel, an orthodox priest expressed a pity that an anathematized 'revolutionary' Leo Tolstoy had not burned personally his religious-philosophical works and that had had to be done by the 'merciful' Church. True revolutionists, however, have been pretending during the last century till recent times that his works had had been burned to ashes and have not been existing. Now, they are bewailing their failure in the 'perestroika' and begin to recognize its true cause – total lack of ethics of any kind in the materialist hypocritical society and its 'elite.'

All these vicissitudes of life can be understood only, if to accept the view, according to which one branch of immigrants from more and more deserted Arabia, having taken advantage of the enfeeblement of the ancient empires caused by some geological, ecological

and climatic calamities, which had considerably damaged economy of ancient civilizations of the Ancient and New Worlds (finally washed off from the surface of the Earth by a wave of resettlements of Turkic peoples from the Far East,) had subordinated northern Africa and made Carthage its stronghold. Though Rome had formulated a slogan 'Carthago delenda est' ('Carthage should be destroyed,') and then, really, could destroy and include it in its empire for some centuries, it had fallen victim in this centuries-ancient antagonism: the ancient European 'pagan' civilization, which stood, on belief of Russian historian M. I. Rostovtsev, on a threshold of capitalism, had been destroyed by barbarians. Then barbarians subordinated the Western Europe, rebuilding European Vedic temples into Christian ones and imposing to everybody nature destructive and misanthropic religion.

Though it sounds unusual – they called themselves 'philanthropists' – however, the term 'misanthropic' is more than appropriate, because they called any non-Christian Antichrist, worthy of nethermost fire, anathemas and burnings alive. In Europe in 'religious wars' – do you feel the absurdity of this combination of words – hundreds of millions lives were lost, thousands of scientists of 'antique,' that is, early mediaeval Vedic or 'scientific' civilization of Europe had been destroyed on fires of inquisition.

As the Slavic states, such as the Moravian, Bulgarian, Serbian, Polish empires, the Saint Russia, later the Kiev's Russia, the White Russia, the Great Lithuanian, Zhemoit and Russian Principality, and the Great Russia represented the most powerful stronghold of the Vedic civilization in Europe, they became objects of the incalculable invasions from the West. Small Sweden launched more than six hundred assaults against the Greater Russia, aspiring to grasp, first of all, island Balaam and Northern territories, but sometimes penetrating up to the center of Russia. The main attacks, though, went from Germany infected with a virus of 'Pull to the East' (Drang nach Osten) since the times of Barbarossa (Frederick I, 1123? – 90, king of Germany 1152

– 90; king of Italy 1152 – 90; emperor of the Holy Roman Empire 1152 – 90,) whose name was used as the planning and operational cipher the Germans gave to their invasion of the Soviet Union on June 22, 1941.) England and France feverishly were struggling with each other for creation of the world colonial empire. Those tensions in new garbs are evident in modern Europe as well.

Then, the other wave of the Arabian immigrants absorbed a part of Christian possessions in the Near East, in Egypt, Northern Africa, Iran and Central Asia. Later, having merged with Turkic nomads, they subordinated all Southern and Southeast Asia, having imposed there by force the Moslem military socialism doctrine, offshoot of Christianity, ideologically even more intolerant towards women and infidels.

Having destroyed cities and libraries in Europe, the immigrants of the first wave thanks to Great Geographical Discoveries, began conquest of new continents, the ‘Western India’ (America,) and then India itself, Indonesia, Iran, winning them from the immigrants of the second wave, and also strengthening pressure on Russia and China...

British colonial Indology

If Hindus have remained unknown to Tatars and us, they would be the happiest people in the world.

Voltaire

As a result of successful military attacks, trading colonial interventions and direct military occupation the yoke of the West-European servitude was inflicted on the most part of the world – on all Western and Central Europe, Africa, Iran, both Americas, Australia, and Indonesia. It began to threaten with final punishment the last strongholds of civilization – in Russia, India, Japan, and China. Everywhere, it was accompanied by mass destruction of local civilized, educated and peaceful Vedic and Buddhist population, its enslavement, slave-trade, mockery of achievements of human intel-

lect, destruction of universities, academies, libraries and persecution of any heterodoxy.



V. V. Vereshchagin, Sepoy firing

In the XIXth century, the Englishmen, two centuries before that time settling in trading forts on Indian sea coast and having the right only to export goods from India, took advantage of that the Hindus under the leadership of Maratha leader Śivaji (1627 – 1680) had crushed Muslim rulers, who during some centuries plundered, enslaved and violently converted to Islam Indian peoples, ‘helped’ Hindus to overthrow Muslim slaveholders, but then deceitfully finished with Hindu leaders and subordinated all Southern Asia.

Western Indology, being formed during an epoch of colonial conquests and incessant repartition of the world, is a direct outcome of the European colonialism, imperialism and missionary propagation, dogmatism and casuistry. There is plenty of evidence in favor of this theory and it has been thoroughly studied by Indian scholars such as Purohit Bhagavan Dutt, the author of the ‘Western Indologists: A Study in Motives’ and many others. Eloquent statements of the leading European scholars, ideologists and politicians revealing their internal motives and latent intentions clearly show true underlying reason of a modern ideological antagonism between the East and the West, roots of politicization of the modern Indology and its

primary susceptibility to subjectivity.

The British government in order to avoid revolts of the Indian population trained the Indian elite with the aim to undermine their belief in Vedic traditions. There is evidence that the British authorities resorted to burning books on ancient Sanskrit medicine in Kerala to spread the European system of medicine. Many British historians were on administrative service and openly defended the thesis of the more remote antiquity and superiority of the European culture.

Lord Thomas Babbington Macaulay

Lord Thomas Babbington Macaulay (1800-59) having become the first Law Member of the Governor-General's Legislature introduced English education in India and began the destruction of the Sanskrit system of education.

Macaulay looked upon the people of India as idolaters, blindly attached to doctrines and rites which are in the highest degree pernicious.' In 1885, he wrote of the 'monstrous superstitions' of India and summarily condemned ancient Sanskrit texts as 'less valuable than what may be found in the most paltry abridgements used at preparatory schools in England.'²⁶

James Stuart Mill

James Stuart Mill was the author of the 'History of British India.' It was written in six volumes in 1818 under the influence of Abbé Dubois' 'Hindu Manners, Customs and Ceremonies.' The French Missionary considered the Hindu idols as products of 'imagination, which cannot be excited except by what is monstrous and extravagant' (p. 607.)

The complex centuries-ancient history of India, which saw

²⁶ J. J. Clarke, *Oriental Enlightenment: The encounter between Asian and Western thought*. P.73.

merge and disappearance of hundreds of big and small states and empires with different political regime, language and culture, was divided in this work into three periods: 'Hindu,' 'Muslim' and... 'British.' According to logic, the third period should have been defined as 'Protestant Christian.'

It is now recognized that Mill's periodization stemmed from the imperialist objective of fomenting a religious divide in India (no wonder, the Mill's History was one of the prescribed texts at the Haileybury College, where the prospective English officers received their training before coming to India.)²⁷

Some Hindu historians call this History the first major racist elaboration of the ancient Indian history and culture in Western Indology. Many of Mill's principles underlie the colonial and post-colonial Indology.

Objectionable 'Distant Relatives'

The ancestors of Indians and Englishmen belonged to the same Indo-European or Aryan language family. Linguistic relationship indicates the common origin of Indian and European peoples.

In the nineteenth century, however, a biological 'race science' attacked the theory of common origin. It redefined the concept of the Indo-European kinship slandering and belittling the achievements of the Indian civilization.

According to Charles Grant (1746-1823,) chairman of the East - Indian company, 'we cannot avoid a recognition of that inhabitants of Hindustan make race of hopeless degenerates <...> controlled by the most vicious and dismissed passions <...> and thrown into sufferings by their own defects.'

In 1861, John Crawfurd rejected the 'claim of a common descent between Hindu, Greek, and Teuton, for that would amount to allowing that there was no difference in the faculties of the people that produced

²⁷ K. M. Shrimali, Aesthetic deceptions, <http://www.hindustantimes.com>.

Homer and Shakespeare and those that have produced nothing better than the authors of the Mahābhārata and Rāmāyaṇa.’

Upon his arrival in 1810, the Gov. General marquis of Hastings wrote in his diary on October 2, 1813: ‘the Hindu appears a being limited to mere animal functions, and even in them indifferent <...> with no higher intellect than a dog, or an elephant, or a monkey might be supposed capable of attaining.’

Clearly, that the officers of the British Empire overfed with similar ideology did not hesitate a moment in application of the most brutal means of ‘overpersuasion’ of their ‘wild’ subjects.

The word ‘Āria’ designated in ancient Vedic India ‘heavenly wise men’ and also ‘educated, noble, especially notable and respected people.’ Having been derided and compromised by Western indologists, it has been associated after the World War II with concepts of racial hatred and blasphemous evil deed.

Russian Indology

‘While other countries pay more and more attention to studying of the East, I would like to think that Russia would keep abreast, at least, in these aspirations.’

S. F. Oldenburg



The spirit of Vedic India is reflected in ancient Russian fairy tales, songs, legends of hoary antiquity called bylinas (‘purāṇas.’) Quite often in fairy tales and bylinas, India is mentioned allegorically and sometimes even directly with constant respect and admiration of its greatness, wisdom and riches. However, in Middle Ages, when direct communications were ruined and the information began to be filtered through Greek and Byzantine authors, a set of fables about India appeared in Russia, eclipsing elements of truth, which were sometimes present only in rare ‘rambles’ of merchants. As V. K. Shokhin remarks, ‘the picture of Russian

medieval information about India is filled with the most freakish, phantasmagoric figures and phenomena, which, though reminding real phenomena, have obviously non-Indian features.²⁸

After collapse in the VIIIth century of the Persian empire, and in the XVth century of the Byzantium, which were original cultural bridges between Russia and India, all direct contacts between our civilizations had been practically ruined for some centuries and emptiness was filled with fables and retellings of foreign impressions. ‘Rambles of Zosima to Rahmanas’ representing mystified retelling of a plot of a meeting of Alexander the Great with brahmanas can serve as an example.



Afanasy Nikitin in India

More authentic story ‘Rambles of Afanasy Nikitin’ was the rare exception more likely confirming this rule. This more than thousand-year breakage of relations, which had occurred as a result of several waves of resettlements of peoples, having ‘overflowed’ the ancient world and buried forever ‘the bridge of land,’ which connected the

²⁸ V. K. Shohin, *Ancient India in the Culture of Russia (XI – XV cc.)*, Moscow, 1988. P. 225.

north and south of Indo-European area, has resulted in oblivion of the cultural foundations of the ancient Indo-European civilization.

The trading way to India seemed to be lost forever, though some sporadic contacts had been supported during the last centuries through Astrakhan and the Siberian capital of Russia Tobolsk. During the XIXth century, Russian intellectuals were fed on particles of information, collecting scrappy data from descriptions and translations of Indian poetry, mainly, in West-European literatures.

Alexey Homyakov, Leo Tolstoy, Elena Blavatsky, Nicolay Roerich, Constantine S. Stanislavsky depended in their judgments about Indian history, philosophy, science, religion and psychology of yoga on West-European translations.

Cultural contacts of Russia and India before independence were sporadic. Scientific studies of the Indian culture began really only at the end of the XIXth century. Several professional indologists (O. N. Bötlingk, V. P. Vasilyev, M. Y. Kalinovich, D. N. Ovsyaniko-Kulikovsky, V. F. Miller, K. A. Kossovich, P. Y. Petrov, P. G. Ritter, M. I. Tubyansky, R. O. Shor) started on their researches of the Sanskrit and Vedic literature. Among them, I. P. Minaev (1840 – 1890) with his pupils F. I. Shcherbatsky (1866 – 1942) and S. F. Oldenburg (1863 – 1934) were most prominent. They made considerable contribution into propagation of Sanskrit and Buddhist Studies, started the edition of the ‘Library Buddhica’ and research of the history of Indian science (‘Scientific achievements of ancient India’ by F. I. Shcherbatsky.)

Remarkably, the understanding of ancient Indian ethics by L. Tolstoy, vision of the Vedic science by E. Blavatsky, of Yogic psychology by K. Stanislavsky, Buddhist religion by N. and Yu. Roerich and Buddhist logic by F. Shcherbatsky were characterized by a deep intuitive insight. All of them produced also a return influence on culture of India and the world. To tell the truth, their talented works promoted occasionally mystification of the Indian culture, emphasizing mainly its spirituality.

Soviet angularity

At the beginning of the XXth century, India was visited by Russian cesarevitch. Interest to India in Russia accrued, but, unfortunately, soon after 1917, study of Vedic and Buddhist philosophy had been gradually suffocated. World famous school of academicians F. I. Shcherbatsky and S. F. Oldenburg was put out of existence with their death for half a century, and Buddhist researches began to appear in the Soviet Union only during the last decades of the XXth century.

Soviet indology was focused in the second half of the XXth century, mainly, on issues of the Indian linguistics, first of all, modern Indian languages, questions of modern literatures, ethnography, history, politics and economy. In this respect, a huge work has been done. Among the researches devoted to the ancient India and the study of Sanskrit literary monuments, names of L. B. Alaev, Y. M. Alihanov, G. M. Bongard-Levin, Y. V. Vasilkov, A. A. Vigasin, O. F. Volkov, E. I. Gosteev, P. A. Grintser, T. Y. Elizarenkov, V. I. Kalyanov, E. M. Medvedev, S. L. Nevelev, E. P. Ostrovsky, A. V. Paribok, V. I. Rudoy, A. M. Samozvantsev, V. S. Sementsov, I. D. Serebryakov, S. D. Serebryany, A. Y. Syrkin, V. N. Toporov, V. K. Shokhin, V. G. Erman are most prominent.

History of natural sciences was touched upon in two-three publications, among which we shall note G. M. Bongard-Levin's work 'The Ancient Indian Civilization' and edition of the 'Śārdulakārṇa-avadāna.' Besides, some translations of the basic texts of the philosophical darśanas (vaiśeṣika, yoga, sāṅkhya, vedānta) were published, sometimes without appropriate comments, as in the case of the 'Vedānta-sūtra,' and without any system (for example, mīmāṃsā, the first of darśanas, was deprived of attention, probably, because it was considered 'servant of religious ritual.')

Only a few śāstras ('sciences') were investigated among them 'a science of economy,' to some extent 'a science of love,' 'the doctrine of Dharma' and 'the doctrine of ayurveda,' but the fundamental Vedic

science of theatre' considered by tradition as the Fifth Veda and a lot of others, including mathematics and astronomy were ignored.

The Vedic mythology was treated as simple assembly of fairy tales ('Myths of Ancient India' by V. G. Erman and E. N. Temkin) or object of a narrow comparative linguistical research (V. N. Toporov's and others' articles for the 2-volume encyclopedia 'Myths of the Peoples of the World,') where it has been treated as a 'prescientific' way of empirical knowledge. Mainly in the same key, myths and all other world religious traditions were interpreted. Scientific publications of the last years in the field of mythology are marked, mainly, by interest only to a plot of narration, cultural and religious reminiscences.

Only the R̥g-Veda was fully translated into Russian. There are some fragmentary translations from the Atharva-Veda. No significant translations of the Brāhmanas and Āraṇyakas, Upavedas and Tantras, Purāṇas and the most important Itihāsa, which is the Rāmāyaṇa of Vālmīki are available. Translation of the Upaniṣadas by A. Y. Syrkin included only those texts, which were considered most ancient and important from the point of view of philosophy.

As to the textbooks of Sanskrit, except for some initial introductory manuals, similar to V. A. Kochergina's manual and her Student's Sanskrit-Russian dictionary containing 30 thousand words, nothing especially remarkable was produced. Till now, there is no main manual for studying Sanskrit and its literary heritage – an authoritative Sanskrit-Russian dictionary comparable in volume, say, to the well-known Petersburg Sanskrit-German Dictionary, 'Sanskrit-English Dictionary' of M. Monier-Williams or 'Practical Sanskrit-English Dictionary' of V. S. Apte. In Russian, there is neither good grammar, nor stylistics of classical Sanskrit, neither a serious history of the Sanskrit literature, nor an all-round and objective history of the Indian philosophy and, a main thing, sciences and astronomies.

The academic translation of the Mahābhārata is being carried out, but is still far from finish. There is no translation of any signifi-

cant Tantra. The research work on Purāṇas has only been started. It is possible to mention only the publication of the first part of the Viṣṇu-Purāṇa by T. K. Posov, translations from translations of the Bhāgavata-Purāṇa of Bhaktivedanta and a short research by P. D. Saharov.

On this background, translations from English of the lectures of swami Vivekananda, made by V. S. Kostyuchenko, and translation of the 'Indian Philosophy' of S. Radhakrishnan were most important works, especially for popularization of the ideas of the Neo-Hinduism. However, most important and fundamental works of S. Radhakrishnan, such as, for example, 'Upaniṣads' or 'Spiritual View of Life' were disregarded.

A number of works of materialist D. Chattopadhyaya were translated from English into Russian, but serious work of his opponents were ignored including Rabindranath Tagore's philosophical compositions such as 'Sādhana' and 'Religion of a Man.' Autobiography of Mohandas Karamchand Gandhi ('My Experiments with Truth') originally written in Gujarati between 1927 and 1929, is now known all over the world and is considered a classic. Its translation also was carried out from English. Besides, there is a biography of M. K. Gandhi written by R. A. Ulyanovsky, but M. Gandhi's central works on nonviolence, satyāgraha ('persistence in truth,') self-government have not attracted the attention of Russian translators.

Recently, some English works on Yoga have been translated, including Aurobindo's 'Synthesis of Yoga,' 'Autobiography of a Yogi' by Yogananda, works of Shivananda, Rajneesh, Bhaktivedanta, Swami Ram and other popular writers on Hindu mysticism. However, works of the majority of historians of the Indian philosophy and researches of historians of the Indian science were ignored. Russian reader can find only some critical articles.

Thus, from this rather brief digression to the history of only one department of Russian indology, but, perhaps, the most central, becomes obvious that the whole areas of the literature of ancient India,

such as the Vedas, the Purāṇas, the Tantras, the Rāmāyaṇa, ethics, mythology, natural science literature, remain investigated either extremely non-uniformly, or in a superficial way, or are made under strong Western influence, or have not been investigated at all. There is a lawful question: what do we in general know today about the essence of Hinduism, if its major texts – the whole libraries – have dropped out of a circle of researches? There are some hypotheses, critical reviews, a few translated texts of different value, perhaps, that is all.

I. D. Serebryakov



The life of I. D. Serebryakov (1917-1998,) Doctor of Philology, member of Asian society (Calcutta,) one of brilliant representatives of the school of F. Y. Shcherbatsky and S. F. Oldenburg, coincided with the duration of the Soviet epoch.

He was born on November 27, 1917 (twenty days after the Great October socialist revolution) in settlement Sartana of Donetsk area. In 1940 he had graduated from the Leningrad's State University, where he studied Sanskrit, Hindi, Bengali and Punjabi. His teachers were academician F. Y. Shcherbatsky and his pupil Prof. A. Y. Vostrikov, indologists M. A. Shiryayev, V. M. Beskrovny, V. E. Krasnodembsky, Virendranath Chattopadhyaya, A. L. Dymshits, and later academician A. P. Barannikov.

In 1947, he together with V. S. Moskalev founded the faculty of the Indian languages in the Tashkent's University. Then, I. D. Serebryakov worked for many years as the correspondent of the newspaper 'Pravda' in India, with which he was connected by thousand strings of friendship and scientific interests: from 1959 till 1961, he had been working in Delhi, from 1964 till 1969 in Madras, visited Delhi in 1970, 1972, 1973, Banaras in 1981, Ujjain in 1983. In 1971, he got

J. Nehru's award for a number of sketches about India published in 'Pravda' and for the books on history of Sanskrit and other Indian literatures, two of which were published in India in English.

As Professor and leading research worker of the Historical Monuments Department of the Institute of Oriental Studies of the Academy of sciences in Moscow, Igor Dmitrievich had been intensively engaged till his last days in the historical study of Sanskrit, Punjabi and other Indian literatures, focusing on the most important tendencies of their development during the last two millennia.

His attention turned thus more and more to the Sanskrit literature, translations of the outstanding philosophic-literary poems representing quintessence of the ancient Indian popular wisdom. He translated into Russian The Pancatantra, 'The Ocean of Story' by Somadeva, a didactic poem 'Hundred Verses on Good Conduct' ('Nīti-Śataka') of Bhartrhari, 'Narma-mālā' ('The Wreath of Jokes') of Kṣemendra and advised me to translate 'Rāmāyaṇa' of Vālmīki, which he presented to me in gift upon termination of my postgraduate study.

Indian Revival

	
Programmers' town Hyteck in Haidarabad	S. Radhakrishnan

In India, the described pseudo-Christian brain washing produced a generation of 'brown sahibs,' who looked down on religion of the masses as 'opium for the people.' After getting independence, the hope appeared that education would restore the Indian values. However,

modern Indian indologists have inherited many biases of the previous generation. So, doctor Humayun Kabir, the former minister of science and culture of the central Indian government, warned: 'The new generation of educated people does not receive any more a feed from eternal traditions of the ground. Their views are Western, more often even pseudo-Western.'

Dilip Chakravarti emphasizes in his book 'Colonial Indology: Social Politics of the Ancient Indian Past,' 'Model of the Indian past... has been imposed through totalitarian methods with the help of the books written by Western indologists, interested in language, literature and philosophy, who were at least haughty arrogant men but more often simply racists...'

More and more modern Indian scholars start to doubt the conclusions of the European historical science. Some Indian scholars challenge the European chronology. Professor Rangacharya says: 'Huge harm has been made almost by all English and American scholars by acceptance of arbitrary early dates for Egypt and Mesopotamia pushed back to 5000 years B.C.E., and by the statement that ancient India borrowed from them.'²⁹ C. R. Krishnamacharlu having analyzed the latent motives of Europeans declared that the authors belonging to the nations recently entered on a way of gains and expansion, write a history not with the purpose of understanding culture, but for the proclamation of the racial superiority, scornfully treating their duty to explain correctly the past of India and not caring about proofs of their historical impartiality, truthfulness and sympathy to its culture.

N. S. Rajaram

N. S. Rajaram is sure that the theory of Aryan invasion was completely denied by discovering the Harappan civilization. He identifies this period as the Vedic culture and Proto-Indian inscrip-

²⁹ History of Pre-Musulman India, Vol. II, Vedic India, Part I. 1937. P. 145.

tions are treated by him as Sanskrit sūtras containing words from the Vedic dictionary Nighantu of Yāska. To tell the truth, the last thesis, to put it mildly, is hasty, though it is supported by an attempt of reading these inscriptions in Sanskrit (vide ch. Vedic Printing Code.)

He says that colonial authorities and Christian missionaries had tried to expose themselves as last wave of Aryan conquerors, to attribute to themselves composing the Vedas and even to present the Bible as an Jesus-Veda.

Max Müller, according to him, was not scholar at all for he had presented the Vedas to create negative interpretation of the Vedas and to clear way for spreading of Christianity.

Namely, political and other reasons directed also archeologist J. Marshall, who investigated Indus Valley civilization fiercely denying its connections with the Vedic culture.

The Marxism replaced the colonial and missionary ideology. Theory of Shengde Malati asserting that Akkadian was the language of Harappans became a part of 'Marxist theology,' which tries to transform Harappans into a non-Vedic people, to deprive the Vedas and the Aryans of their Indian origin.

A Proto-Dravidian language invented by linguists for proving the Aryan-Dravidian divide never existed in history. Aryan-Dravidian division is based on racial theories. Difference of Sanskrit from the so-called Dravidian languages is exaggerated, as the latter are the same inflectional languages as Sanskrit.

The modern linguistics resembles more a pseudo-science or theology. The most part of the linguists does not know languages of India. Moreover, archeologists have subordinated their own interpretations to historical, cultural, chronological statements of linguists.

Indology is in a big degree a megaphone of Eurocentric views on history and civilization. It has given a little for our understanding of ancient India. European indologists frequently show 'inflated complacency' and 'absence of critical spirit.' Indology is unable to provide a logical toolkit and methodology for decoding of Indic script.

6. THE VEDIC EMPIRE IN ANTIQUITY

Place of Creation of the Rig-Veda

O monarch, let celestial emperors Varuna, Brihaspati, Indra and Agni support your state, by their majestic authority!

***'Blessing to emperor' of
the wise man Dhruva ('Majestic
Axis of the World,')***
(RV, 10.173.5; AV, 6.88.2.)

The brilliant and skilful celestials-singers ascended, fanning the flame of the Moon, similarly to the stars melting out generations of living beings as if iron.

RV, 4.2.16-17.

During two hundred years of direct contacts of Europeans with Indians, the European scholars tried within the framework of their history, religion and philosophy to prove the superiority and even the idea of the European ancestral home for authors of the Vedas, the so-called Aryans.

It was placed in the Southern Russian steppes, in the center of the Western Europe (T. Barrow,) in the Balkans (I. M. Dyakonov,) in the Southeast of Anatoly (S. Renfrew,) even beyond the Northern Polar Circle (B. G. Tilak.) Some Western researchers, as, for example, J. P. Mallory, recognized that all these theories were groundless, and it is necessary to choose the least bad from them. Others, as, for example, Edmund Leach, Nicolas Kazanas, K. Klostermeier, G. Feuerstein, David Frawley, Conrad Elst, reject it as insolvent and not explaining all the sum of the facts known nowadays to science.

As Greek indologist Nicolas Kazanas argues, the linguistic data, which are used mainly by the European scholars, are inconsistent and misapprehended, while under pressure of a mass of archeological and other evidence, from the middle of the 80-th, unanimity among archeologists was established. It became obvious that the Indic civi-

lization existed in India on all the extent from Kashmir up to Deccan and from Indus up to Gaṅgā from the 7th thousand B.C.E.

Brāhmaṇas, Puranas, Itihāsas and astronomical treatises specify 3102 B.C.E. as the beginning of the Kaliyuga, and place the Ṛg-Veda to much earlier epoch. Nicolas Kazanas point at that there is also written evidence in the ‘Avesta’ indicating that the ancient Iranians migrated from the Eastern country Sapta-Hindu (Indian ‘Country of Seven Rivers,’) having crossed 16 countries. Indian legislators of antiquity defined their country namely as the ‘Union of 16 Jana-Padas or Republics.’ Moreover, according to Avesta, the river Harahvayti (i.e. Sarasvatī) flowed also in that country. Seeing all that, confidently concludes N. Kazanas, the Ṛg-Veda must be dated as far as the 4th thousand B.C.E., and India should be recognized as the native land of the Indo-Europeans.³⁰

Now, it is possible to assert with confidence that Eurocentric theory, which was denied furiously during the two last centuries by the Indian thinkers and historians, has gone bankrupt also in Europe for it was an offshoot of the ideology of colonialism and had no serious scientific substantiation. Last decades have seen even among Western indologists a considerable strengthening of the tendency to correlate the Vedas with the ancient so-called Proto-Indian, Harappan or Indo-Ghaggar civilization prospering in Southern Asia during the period between the 7th – 2nd thousands B.C.E.. Due to efforts of archeologists of the last century, it became clear that the territory, which was covered by this civilization, was not limited at all to the Indus Valley and occupied a significant part of the Northern and Central India up to the river Gaṅgā in the East and up to the rivers Narbada and Godavari in the South and even spread outside the limits of Hindustan to Afghanistan and Central Asia.

In this connection, there is a lawful question, where in India its center was and where it is necessary to search for its capital and

³⁰ Nicholas Kazanas, Date of Rigveda: A Postscript, published on the internet <http://www.indiaserver.com/frontline/2000/09/30/17200040.htm> .

location of the Vedic Academy. Till now, science disposed of only indirect data, basically, from archeology, comparative linguistics and Indo-European studies, which related the Vedas to the Indus Valley only on the ground that the word 'Sindhu' ('River, Ocean') fixed during subsequent time as the appellation of the Indus river is frequently mentioned in the Ṛg-Veda. However, Gaṅgā (sometimes obviously called Sindhu) is also mentioned there with its 'inflow' Gomati. Moreover, the river Sarasvatī (Brahmāputrā) and many other rivers, which can be hardly identified as inflows of Indus, are referred to alongside Indus.

Modern identification of the river Ghaggar (Hakra,) which flowed once along Indus or was its previous bed and then dried up, with Sarasvatī is nothing else as a product of misunderstanding. It has arisen from a naive bias that Aryans came from the West and the Vedas were related to the Indus Valley. By the way, one of the important inflows of Gaṅgā also is called similarly Ghagar. That name, obviously, goes back to the same root and specifies its originality and antiquity. If Ghaggar is Sarasvatī, then we have, apparently, two different Sarasvatīs (not considering Brahmāputrā.) That cannot be proved by any texts. Brahmāputrā ('Brahmā's Daughter') means namely Sarasvatī, which was mythologically strictly connected to the East (symbol of the full moon day) and was described as the deepest river. By the way, lower reaches of Brahmāputrā flowing in the East of Hindustan are characterized by the heaviest rainfalls and flooding on the planet. The location of the Vedic 'river' Sarasvatī in the Mahābhārata is the Eastern Side of the horizon. In astromythology, the 'East' corresponds to a day, on which the full moon appears on the Eastern horizon for the first time in the synodical month.

Sarasvatī in the Vedas is a 'river' of the zodiac, the daughter and wife of Brahmā, the Moon or the Sun, around whom she performs a magnificent dance, which Brahmā beholds having created for himself four faces (four years.) Generally speaking, all Vedic 'rivers' are symbols of months and halfmonths, of days of the full

and the new moon, which course is governed by the Zodiac and is decorated with nakṣatras. The ‘Ocean’ is clearly a symbol of the Year (YV, VII.5.1.2.)

Moreover, the name of the ‘mother’ of Sarasvatī also has astronomical connotations. It is Payasvinī, a ‘river’ connected with the ‘Southern Mountains’ called Vindhya, an astromythological symbol of the Northern tropic as also of the waning Moon. Name Payasvinī has two meanings one being ‘dairy cow’ and the other ‘Night,’ mother of all the forms of the Moon and night stars.



Cow the Mother-Universe, Abode of
Celestials

This poetic imagery explains the sacredness of the cow in India, ‘in which body all the gods abide’ (planets and phases of the Moon.) The same lunar imagery is behind the sanctity of the central regions of India. The image of Sarasvatī as a river flowing to the North and further making a circle to the East, and, especially, its image as the Vedic goddess of eloquence and wisdom are traced to the same source. Gaṅgā flows down from the Northern mountains called ‘Winter’s Home’ (Himālaya) down the Śiva’s black hair (the night sky of a dark half of the synodic month) carrying away to the ‘sea’ of the night sky of a new moon period the ashes of burned down phases of the Moon. The Ṛg-Veda being connected to the Eastern Side, praises naturally, first of all, Sarasvatī and only incidentally mentions Gaṅgā, whereas

in the Atharva-Veda, connected mythologically with the ‘Western Side’, Gangā plays a leading role.

Historians whose ostensible purpose is to disrobe ancient highly spiritual and scientific mythology with naturalistic methods make purely false conclusions about a later origin of the Atharva-Veda allegedly testifying to the movement of the pseudo-Aryans from the West to the East, from the coasts of Indus to the coasts of Gangā. The Atharva-Veda is soaked with archaic language and cultural elements, grammatical ‘irregularities’ and ‘poetic flaws.’ That, in opinion of



A. I. Kuinji, Dnepr in the morning

some Indian Vedic specialists, specifies just its earlier origin in relation to the other Vedas. For me, it is clear that this dispute is groundless, as all the four Vedas are synchronous, are organically astronomically-mathematically and calendrically-functionally interconnected, as it will be shown in the subsequent chapters. They have the same calendar-astronomical plan built in their mathematical structure, which loses sense with the exception of even one element.

That the most ancient immigrants from India to Europe esteemed

Sarasvatī and Gaṅgā is suddenly evidenced from the toponymy and hydronymy of Byelorussia. Last decades, a big research work based on the study of this important historical European material has revealed a weighty mass of Indo-European parallels. One of my own observations is the following.

The configuration of the rivers and length of the Gaṅgā and the Dnepr are rather similar. It is known also that people having inhabited the coasts of the Dnepr before acceptance of Christianity worshipped such gods as Perun, Mahosh, Horiv and Kashchey Bessmertny (Kashchey the Immortal.) All these names are a little bit corrupted epithets of Śiva, 'Benevolent (God of the Moon)' called, for example, Mahesh, Amar-Natha ('The Great Sir,' 'The Immortal Lord.')

Some comparisons of Slav and Tamil god's names such as Slav. 'Perun' and Tamil 'Peruman' (The Supreme God,) from Tamil 'peru' ('great,') undoubtedly, indicate that among ancient Slavs, natives of India, were also Tamils. My analysis of Tamil and Slavic lexicons brought to light a list of important Russian words, which can be explained by their derivation from Tamil not Sanskrit (for example, the aforementioned word 'Perun' in Sanskrit has the form 'Parama.')

So, the Immortal Kashchey of the Russian fairy tales is no other than the Vedic 'Immortal Lord' (Amar-Natha,) Śiva or Agni (Rus. 'Ogon' pronounced 'Agon,') in whose honour the Vedic architects built in the middle course of the Ganges the city Kaści, the most sacred and most important of the seven sacred cities of Hindus. Its name means 'Light' (of the Heavens decorated with the Sickle Moon, 'Shining' city of Śiva, nowadays, called Varanasi, Banaras.) It hosts more than 1500 Śivaite temples. In a corresponding place on the Dnepr, Kiev, mother of Russian cities, was constructed, according to a legend, by Kiy, Shchek, Horiv and their sister Lebed' ('Swan.')

A swan in India is a riding animal of Brahmā and a symbol of his divine spouse Sarasvatī. 'Kiy-Shchek' is, probably, a corruption of the Sanskrit name Kashchi. Or, perhaps, we can compare the name 'Kiy' to the Vedic name 'Kā' ('Who,') used for 'god,' 'Shiva,' 'Viṣṇu'

and ‘Brahmā.’ ‘Horiv,’ definitely, reminds the name of Iranian Hors or names of Hari (‘Viṣṇu’) and Hara (‘Śiva.’)

Cities with similar names stand on the same bends of the Dnepr and the Ganges. So, in headwaters of the Dnepr, in that place where it turns to the South, we find on the high coast the city of Orsha, which dates from, according to Christian annals, not less than one thousand years (and the Christianity itself has appeared in Russia only one thousand years ago – about earlier Vedic times, it knows almost nothing.) On a corresponding bend of the Ganges, in its headwaters, there is a city of Ṛṣi-Keś (‘City of Rishi.’)

It is known that the city of Orsha had been founded by a certain boyar Rysha. This name is the same as the Sanskrit word ṛṣi (the heavenly wise man – astrologist, a planet, a star or a year – see a ch. on the ṛṣi code in the IInd Part.) On the other hand, the adjective from Sanskrit ‘ṛṣi’ – ‘ārṣa,’ that means ‘suitable for wise men, sacred’ – sounds the same as the Russian name ‘Orsha’ or the Belarusian ‘Arshitsa,’ the name of the inflow running into the Dnepr in Orsha.

‘Orsha’ in this context can be interpreted as a place and the river, suitable for wise men. Really, the city is conveniently located on the Orsha mount. During former times, highways from the Varangians to Greeks and later from the West to the East of Europe were crossed here, as today highways Moscow – Brest and St.-Petersburg – Khar-kov – Kiev – Odessa are. Significance of this small industrial city also is determined by its geographical position as one of the major transport junctions on the Russian plain. Besides, it was once an important cultural center, in which there were more than ten various monasteries and temples. Finally, two centuries ago, Byelorussian Agricultural Academy had been founded only 40 km away, probably, owing to its convenient placement on the territory of Russia.

The name of the Dnepr River itself goes back to such Sanskrit words as Danu (a name of one of the three heavenly rivers, mother of Danavas) and ‘upar’ – ‘top, high,’ that, probably, was opposed to its ‘bottom’ rivers (Dnestr, Danube and Don.) Immigrants had left on

the map of Europe one more remarkable name of the Sanskrit river, namely, Rasa (Russian 'Ros') going back to the names of the Vedic 'rivers' of the zodiac Rasa and Sarasvatī. All these reminiscences, which can be multiplied, speak about Slavs as a Vedic people well familiar with the Indian astromythological toponymy.

The theory of naturalistic rectilinear geographical interpretation of the Vedic names is defective from one essential point of view – 'rivers' and the other natural and social phenomena mentioned in the Vedas are metaphorical astrocalendar terms; as mythological terms, they are originally related to the sky, mainly, night sky, and corresponding place names are originally 'consecrations' of terrestrial objects by the heavenly phenomena associated with them. Astronomical character of these associations is rather clear, and all conclusions made without taking into account these associations suffer from down to earth naturalism and, inevitably, are turned upside down.

The archeological area of settlements of Proto-Indian type constantly extends, having penetrated to Afghanistan, Central Asia, Gangetic plain, Deccan... Its age gradually is being pushed further into the past, and there is a lot of new evidence of its relation to the subsequent civilization in India, to other close and even rather remote civilizations of the ancient world. Therefore, the theory of Aryan invasion pretending to be based on sound platform of positive science is predominantly intuition, aprioristic judgment using indirect data. This theory requires revision and specification in the light of more concrete discoveries and facts.

Obviously, we need more reliable and positive facts. Are there any exact topographical indications, rather than poor and ambiguous lists of names of mythological rivers in the Vedic texts? It seems, there are: mathematical-chrono-textual organization of the R̥gvedic mantras contains rather exact data on the longitude of the day and night, presumably, in days of solstices and equinoxes.

The R̥g-Veda, as it will be proved in the chapter on the chronometric code, could have been read during three full days; the quantity

of its mantras corresponds absolutely to the quantity of seconds, which the Sun passes just in three days. It would seem, that performance of the four Vedas was attached, in particular, to the initial days of the four seasons of the year, which coincided with the annual turning points!

In the chapter about the daily syllabic-chronometrics, it will be shown how maṇḍalas of the Ṛg-Veda could form six blocks, most likely, according to our average calculation, equal to six half-days:

13,4 : 10,6; 10,4 : 13,6 and 12 : 12 hours.

That can be interpreted as duration of the day and night in days of winter and summer solstices, spring and autumn equinoxes. The ratio is determined from quantitative chronometric decoding of the Ṛg-Veda and is completely organic.

Earlier, Ramatosh Sarkar³¹ used data of the Jyotiṣa-Vedāṅga of Lagadha on the duration of the day and the night for definition of longitude of a place, to which they could be attributed, and has established that the ratio 14.4 : 9.6 hours indicated by Lagadha corresponds to the longitude of 34° passing through Kashmir, the most Northern part of India, which was considered as especially esteemed sacred country thickly inhabited by wise men and abounding in Vedic and Buddhist schools and universities. This longitude is higher only four degrees to the North from that, on which such important astronomical-architectural complexes of the ancient world as the biggest ‘solar’ pyramid in Giza in the Upper Egypt are located, ancient Harappa and the sacred cities of Rishikesh and Hardvar on the Ganges in India, Buddhist capital Lhasa in Tibet and some pyramids in Northern part of peninsula Yucatan in Mexico.

Taking into account results of the researches of Stonehenge by G. Hawkins, who was sure that the longitude of the Stonehenge had been chosen by its builders meaningly as the basic lines set by megaliths and extreme positions of the Moon and the Sun, form a

³¹ Chattopadyaya, D. History of Science and Technology in Ancient India: the Beginnings. Calcutta, 1986. P. 486-494.

rectangular at this longitude,³² I found in 1995, analyzing quantity of hymns in maṇḍalas of the R̥g-Veda, some similarities between those numbers ordered by the sequence of maṇḍalas with azimuths of the Moon at the longitude of mountainous Kashmir. It was the first timid approach to longitudes of India.

Then, N. S. Mikhailova in 2003, having applied the same formula, as R. Sarkar did, without additional specifications received the



A. I. Kuinji, Dnepr in the evening

following result determining the longitude of the place where day during a summer solstice has duration 13 hours 25 minutes (13.4147 hours):

$$\begin{aligned}
 \frac{2}{15^\circ} \cdot \arccos(-\operatorname{tg}\varphi \cdot \operatorname{tg}23^\circ 27') &= 13.4147 \\
 \arccos(-\operatorname{tg}\varphi \cdot \operatorname{tg}23^\circ 27') &= 13.4147 \cdot \frac{15^\circ}{2} = 100.61025^\circ \\
 -\operatorname{tg}\varphi \cdot \operatorname{tg}23^\circ 27' &= \cos 100.61025^\circ = -0.18412719 \\
 \operatorname{tg}\varphi &= -0.18412719 / -\operatorname{tg}23^\circ 27' = 0.18412719 / 0.433775 = \\
 &= 0.424476
 \end{aligned}$$

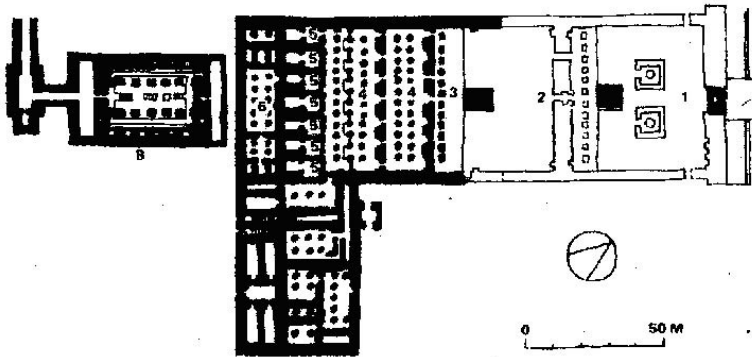
³²Hawkins G. S. Stonehenge decoded. L., 1966. (Russian Tr. Moscow, 1984.) P. 242.

$$\varphi = 23^\circ.$$

S. Kak has arrived strictly at the same longitude independently having compared some figures found in the Vedic ‘altar.’

Astronomical feature of this longitude is that it corresponds to the Northern Tropic or Tropic of Cancer, where on the day of summer solstice (on June, 21-22) the Sun at midday appears directly in zenith.

There is evidence from other parts of the globe testifying to the significance of this longitude. Thus, one of the most known temples in honour of Isis, which later became the main place of worship of the sun Osiris was founded at this longitude on the island of Fillet situated higher up the river from Aswan dam. Popularity of this temple has surpassed attractiveness of the main city of worship of Osiris – Abydos, and festivals assembled huge crowds of pilgrims down to that time, when emperor Justinian (527-565) has forbidden them.



Temple of the Sun in Abydos

- 1 – the first courtyard
- 2 – the second courtyard
- 3 – a verandah at the entrance
- 4 – a pillared hall
- 5 – a chapel (bottom-up: Seth, Ptah, Ra Garahuti, Amon, Osiris, Isis, and Gor)
- 6 – a hall of Osiris

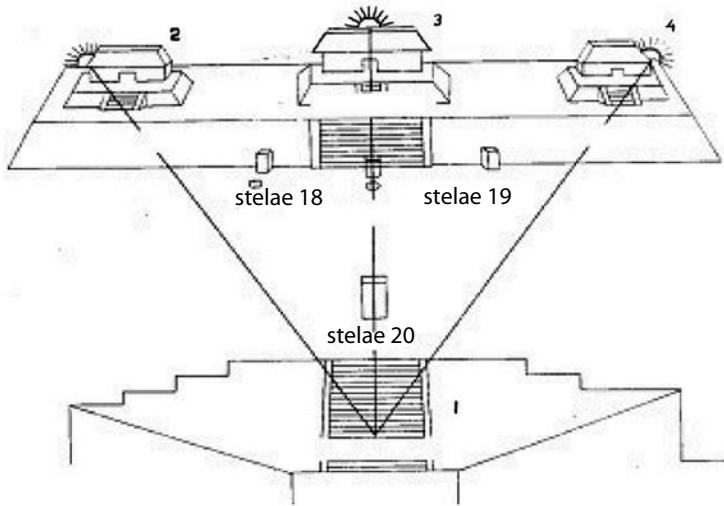
7 – imperial gallery

8 – a symbolical tomb

North

Sun rise

South



Azimuths of sunrise in astronomical Temple complex in Vashaktun

1 - an observational platform at top of a pyramid

2 - sunrise on June 21

3 - sunrise on March 21 and on September 21

4 - sunrise on December 21

In general, all Egyptian pyramids and temples were the observatories devoted to the Sun, the Moon and the Planets. Therefore, for example, in a temple of Seth in Abydos the beam of a rising sun on the day of an equinox twice in one year penetrated inside 63 m deep and touched one of the seven statues of the sun Ra (Ra-Garahuti, Ram-Ses and Amon-Ra,) marking three days of an equinox. Statue of Ptah in the temple of Seth, who was considered the god of the invisible Sun, was never touched by the sunbeams. Unfortunately, after the temple had been transported on the other island during construction of the

dam the ancient absolute accuracy was not preserved. The name 'Ram' is reminiscent of the Sanskrit name 'Rāma-Candra,' whose meaning is the 'Fair Luminary' – the Sun or the Heavens decorated with a Sickle Moon.

Two major Islamic cities, Mecca, birthplace of Muhammad and spiritual center of Islam, and Medina, where Muhammad was first accepted as the supreme Prophet from Allah and where his tomb is located, are situated close to this parallel (21° and 24° N.)

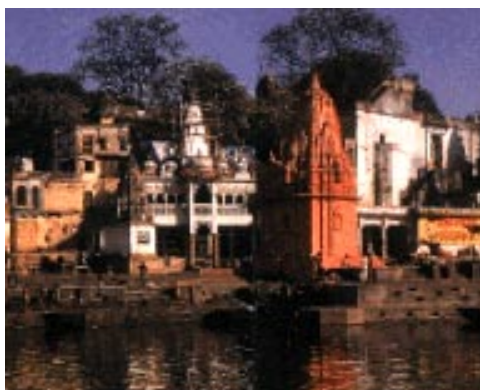
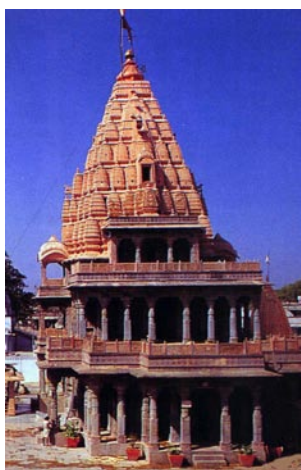
The major pyramids on the peninsula Yucatan in the central Mexico are also close to the Northern tropic. Curiously, the name of the people Maya coincides with the Sanskrit name of the primordial matter (maya) or mother of the universe as well as with the name May ('Measurer,' the Moon,) Vedic 'architect' of the celestials. Besides, principles of architecture of American Maya, in the opinion of outstanding temple architects of South India, correspond in many respects to the Vedic architectural canons. Thus, it is completely clear that the majority of Mayan pyramids served as astronomical observatories, as it is well evident in the Vashaktun complex.

Some scholars, for example, B. Chakravarti, the author of two-volume research 'Indians and Amerindians,' insist on that ancient Indians even up to mediaeval astronomers were well familiar with America, which they called Patala-desha ('Basement country') and on which culture they produced long and deep influence, evidenced in anthropology, mythology, architecture, astronomy, botany and in many other spheres.

Numerous facts testify to the truth of conscious consecration of architectural and geographical objects to astronomy by ancient Indians, who gave astromythological names to the noteworthy places located at certain longitudes. For example, they gave the name Sumeru ('Excellent Meru') to a big volcano located a little bit to the south of equator on the island of Java in Indonesia. The name of their ancestral home in India – Meruka – is related to that very name of Meru.

The longitude 23° passes through the middle of India divid-

ing it in Northern and Southern parts. Nowadays, the new capital of Gujarat Gandhinagar rises at this longitude. Such modern cities as Bhopal and Jabalpur are located here. The latter city was named thus yet in the Vedic times, maybe, in honour of Jabala, a courtesan, who brought up the illegitimate son, according to Upaniṣadas, so truthful that he obtained the status of Brahman. I see here a hint at that, at this longitude, even a non-Brahman, non-astronomer, could determine a solstice with ease, i.e. could be ‘exact’ and ‘truthful’ in difficult astronomical calculations.



Ujjain

Near this longitude, a modern city Ranchi is situated, a little bit to the South, Calcutta (capital of the state West Bengal) and a little bit to the North, Dacca (capital of Bangladesh) are located. It passes through the mouth of the Indus and through the mouth of the Gaṅgā, a little bit to the North of peninsula Kathiawar and ancient cities of Indus civilization Dholavira, Surkotada and Lothal. What is more, it passes through the mountains Vindhya (in the Vedic mythology a symbol of the Northern Tropic) and the city of Ujjain (one of the Seven Sacred Cities, which stood on the zero meridian of early medieval Indian astronomers, among whom we meet such stalwarts as Varāhamihira.)

The central trading road from the North to the South of the country in the early Middle Ages passed through Mathura and Ujjain. Even more wonderful is that the well-known emperor Ashoka, the main propagator of Buddhism in India and abroad, was the governor in Ujjain in the 3-rd century B.C.E. His children – son Mahendra and daughter Sangamitra – disseminated Buddhism in the South of the country and beyond, in Sri Lanka. Among sacred cities of India, Ujjain occupies a place of honour close to Varanasi on the Gaṅgā, Jagannath Puri in the East, Dvarka in the West and Kanchi in the South. It is a sign of that India was thought by its founders as one great whole, as a cross-shaped astronomical temple under the canopy of heavens, and its true center is crossing of the median Zero Meridian and Northern Tropic.

Among other remarkable settlements in the center of the country on the Northern tropic, it is necessary to name Brahma (typically, position of the god Brahma is zenith,) Udayagiri (‘Mountain of the maximum sunrise’ marking the position of the sun during the summer solstice, the highest one in the Northern hemisphere,) Viṣṇupur (‘City of Viṣṇu,’ which crossed the whole world in three steps – obviously, it means three positions of the Sun: on the Southern tropic, on the equator and on the Northern tropic – and overthrew the demons, long nights, with the third step, in the underground world,) and Durgapur (‘the City of Durgā, the ‘city’ of the ‘Far going’ Night.)

On the East coast in the mouth of the Gaṅgā, there is Tamralipta, an ancient settlement and the country, sometimes ‘continent,’ with a polysemic mythological name. Literally, the name means ‘Object stuck round by copper or red sandal powder,’ ‘the Black Minute or a Meridian,’ Daughter of Dakṣa, the Zodiac, and Spouse of Kaśyapa, the full Moon, from whom the ‘birds,’ planets, originated.

Finally, at this longitude, strictly on the tropic and in the center of Hindustan, the settlement Sanchi is situated. It is noteworthy thanks to the most ancient and the biggest in India Buddhist stupa, a dome-shaped temple representing the universe.

The most ancient Buddhist relics are situated, mainly, in the north-east part of the Hindustan (in Nepal, Uttar Pradesh and Bihar) between 82° and 85° E. These are Lumbini, Shravasti, Sarnath, Varanasi, Vaishali, Pataliputra (Patna,) Nalanda, Gaya, Bodhgaya. Suddenly, the most famous Buddhist governor appears as the town governor of Ujjain, and the biggest stupa is constructed far from this historical center on the meridian 78°.



Temple of the Universe in Sanchi

Besides Sanchi (in the center,) this meridian hosts such sacred cities as Rishikesh and Hardvar (in the north,) Mathura (also Madhupura or 'Mead-Bourg,' cp. Lake Mead) and Agra (to the south of Delhi,) Bangalore, Kodaikanal (not far from which Madurai named in honour of Mathura is located,) Tirunelveli and Kanyakumari (the most southern point of the peninsula.) Pay attention to that the two sacred cities located near this meridian – one in the North, another in the South – have identical names 'Mead-bourg' (Mathura and Madurai.) Certainly, this points at the conscious choice of names for

the two especially honored sites marking the most important median meridian of Hindustan.

Location of the biggest stupa on this meridian in the center of Hindustan shows a desire of the propagators of Buddhism to establish it as an imperial and universal ideology. It acquired this status, really, in Asia in the subsequent two millennia. Buddhism was intentionally spread across India and beyond its limits as part of global politics of Ashoka (268-231 B.C.E.) and his followers. Therefore, the choice of the place for the temple in Sanchi was not at all arbitrary.

The stupa's form is rather symbolical: it reminds a dome of heavens, the universe, has a fencing around its dome and on the top of it, that somewhat relates it to the calendar observatory of the Stonehenge. The plan reminds similar circular representations of the sky with the rectangular or cross-shaped symbols of pre-Columbian America and other places.

The tradition of building dome-shaped temples in India, apparently, goes back to the very ancient times as it is testified by cave constructions of the ancient period (2nd-1st millennia B.C.E.) Let us mention a round construction in a wide square courtyard in Mohenjo-Daro, which belongs, most likely, to the similar type of temples, revealing long continuity in ancient Indian temple architecture.

The antiquity of the tradition of astronomical observation in the Sanchi settlement and the special significance of this longitude for scientists of the most gray-haired distant past is supported by presence in the vicinity of this place of 500 ancient caves with cave paintings of the late Stone Age. Since the most ancient times, people in India collected bits of astronomical information, which later formed the basis of the Vedic chronometric supercomputer, under the Northern tropic.

G. Hawkins noted also the seeming relationship of the cave paintings of ancient Europe not with simple stages of hunting, but primarily with the astronomical-calendrical observations, which had been written down with symbols of animals, people and special

signs.³³



The same can be said about the lines of signs (for example, from Singanpur in the South-East part of Madhya Pradesh, 40-12 thousand years B.C.E.), reminding the sun or the moon among and abstract symbols, which meaning till now remains unidentified. The antiquity of the paleolithic paintings of Madhya Pradesh is evidenced by many facts, one of them being the image of a kangaroo indicating once existing ties or, probably, the bridge of dry land between Asia and Australia.³⁴ Besides, the signs of the Proto-Indian script are found so far to the East as the Easter Island, laying in the Pacific Ocean at the coast of America.

Constructions similar to the Sanchi temple were erected rather far from the center of Buddhism in Bihar, even far from the coasts of India. The first to be mentioned are the island of Sri Lanka and the island of Java, which are situated from equator to the North and the South a little less than 10°.



Borobudur

Borobudur had been constructed about 800th year of the C. E. in the South of Java, where the Hindu culture dominated, as a minimum, from the beginning of the C. E. The sanctuary was a 10-storied pyramid (remining ten maṇḍalas of the R̥g-Veda) rising up to 32 meters

³³ Hawkins G. S. *Opp.Cit.* P. 195.

³⁴ S. I. Tulyayev, *The Art of India: IIIrd millenary B. C. E. – VII C.E. .*, 1988. P. 29.

(Buddha has 32 cardinal virtues) and decorated with 504 statues of Buddha and 1460 scenes in relief from his life.

The number 1460 is reminiscent of the four years of 365 days (for full accuracy, it needs only one day, which hidden symbol is latent somewhere inside the pyramid or its quadrangular configuration, meaning a special hidden intercalary day of the leap-year consisting of four quarters of a day.) We shall meet not once this number, analyzing the Vedic calendar memorial and quantities of mantras of the four Vedas themselves, and especially, the quantity of mantras of the Sāma-Veda.



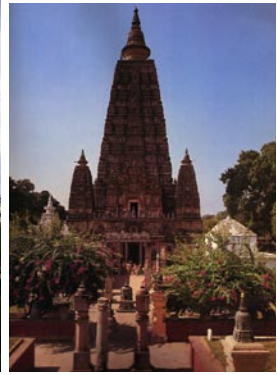
City-temple of Minakshi, the Star-Fish-Eyed goddess, the Spouse of Shiva, the Empress of the Universe, in Madurai

As to the number 504, it is equal to the sum $360 + 144$ (or $360^\circ + 4 * 36$.) In one year of 360 days, there are 144 ($12 * 12$) periods of 2.5 days (60 hours or 75 muhūrtas,) and 12 such phases in a month. In four years, there are 144 periods of 10 days each. The number '144' is multiple to the number of minutes in a day (1400 minutes) and to the quantity of syllables in the Sāma Veda (144000 syllables.) Besides, it is the tenth part of the 1440 days.

This Buddhist pyramid located thousands of kilometers from India can serve as indirect confirmation of the relationship of the Indian, Egyptian and American pyramids-observatories, which, most likely, are products of the same architectural astromythological culture, which center was India.

Let us not overlook arguments brought in favor of the global civilization characterized by pyramidal temples with India as its center. Pyramids are present in the North and in the South of India. In the South, temple cities decorated with the most remarkable pyramids in the world have been preserved. They are entirely covered with the color sculptures on the themes of the Vedic mythology and are named gopuram ('cow-bourg' of the 'bull gate.')

The Śiva's bull Nandi is represented on the entry level of a pyramid, caring on his back Śiva, Pārvaṭī (the Highland River, Daughter of the Himālaya, Durgā, the Night Sky) and as if all the other inhabitants of all the nine planets.



Sothern India

Bodhgaya

A bit to the North from the tropic, majestic Śivaite temples of Khajuraho, Varanasi, the ancient centers of Buddhist settlement Bodhgaya and the world famous university Nalanda are located. Some degrees to the North, Indo-Gangetic plain lies with the deserted cities on Indus and its inflows and modern sacred cities on the Gaṅgā. To the South from the tropic, the valleys of the rivers Godavari and Krishna lie, up to which the Proto-Indian culture was spreading as it has been definitely established by archeologists. Here are now the

largest cities of Bombay, Poona, Sholapur, Hyderabad, Vijayawada, Vishakhapatnam and other.

A bit to the south of the tropic, delightful Śivaite, Vaishnava, Buddhist and Jain relics lie. So, the remarkable historical and cultural features of the 20th parallel, which crosses the mouth of the Mahanadi river, are three very important sites of antiquity and Middle Ages: Bhubaneshwar and Konarak with hundreds Vaishnava temples in honour of Sūrya and Viṣṇu, the Sun or the full Moon, the city of Chandrapur in honour of the waning Moon in the center, and Ellora and Ajanta with Buddhist and Śivaite cave temples in honour of the new Moon in the West, as the first sickle Moon appears on the Western sky, whereas the full moon appears in the East.

The Vedic tradition to crosswisely plan not only the temples, but also the country, locating sacred settlements and cities on the basic geographical directions, is substantiated by a legend attributing to Shankara, the greatest symbolical commentator of the Vedas usually dated back to the 8th century, the creation of the four Shankaracharya monasteries, working until now, in four extreme geographical points of India. Thus, cultural unity of subcontinent and particularity of its geographical situation was fully recognized in the days of Shankara. It is natural to imply that it was so earlier in the days of Buddha. Obviously, this tradition goes back to even more ancient Vedic times.

It follows thus, that the R̥g-Veda had, presumably, been composed somewhere on the Northern tropic, in the center of the subcontinent or at the Eastern or Western coast. In the Western India, Lothal or Dvarka might have been such a place. Dvarka was located a bit to the South from the tropic, on the seacoast, where in the coastal waters archeologists have found traces of a very ancient city, probably, going back to times of the Proto-Indian civilization and Mahābhārata, which mentions it as a city of the god Kṛṣṇa, embodiment of Viṣṇu, the Saturn.) In the Central India, some ancient settlements having existed on the place of Ujjain and Sanchi, or settlements, which were settled down the river Narmada, for example, Jabalpur, could pretend

to be centers of the Vedic Academy.

In the East of the country, such temple complexes as Bhubaneswar, Konarak and Puri in the mouth of Mahanadi are most significant claimants. That was namely Puri's shankaracharya Bharathi Krishna Tirtha who had half a century ago restored a number of surprising principles of the Vedic mathematics. That can be considered symbolical. Thus, any of the above mentioned places, if not all of them, could challenge the right to be called the capital of the most ancient Vedic academy.

From the cultural point of view, the 23° parallel passes through the so-called 'Median Country,' proclaimed by the Vedic deity-legislator Manu the ancestral home of the Aryans. Apparently, it was not less culturally and economically advanced in relation to other adjoining regions of the Southern and Northern India in the Vedic times (7th-1st millennia B.C.E.)

Therefore, the Indus valley should be considered as one of the peripheral provinces of the Vedic Empire, intermediate area of the Aryan expansion to the North-East. They appear in this region from the Central India as astronomers, who systematically used their astronomical wisdom in city planning and building. It also explains, in particular, the significant circumstance, that, with abandoning of the Proto-Indian cities, the Vedic civilization had not disappeared and had not interrupted its development, but, on the contrary, reached several times in history unprecedented heights, which rightly could be called its 'Golden Ages.' I mean not only spreading of Buddhism and the 'Golden Gupta's Age,' but also less known brilliant epoch of blossoming of Kashmir, rise and East expansion of the Southern empires of Cholas, Pandyas, Cheras and Vijayanagar. Modern India can be counted to a certain extent in this row of ancient civilizations, as it has kept its unique ancient exotic profile embellished with contemporary achievements.

With decline of the metropolises of the ancient empires, such as Egypt, Sumer, Greece, Maya, Inca, all memory of their glory quickly

faded, and they, as a rule, left cultural arena or disappeared. If ‘the Median Country’ of the Vedic power was on Indus and was unique advanced cultural area in Hindustan, with its utter desolation of inhabitants more than one thousand years B.C.E., the Vedic culture would stop its existence for ever. It is obvious that it had other more significant centers in India, most likely, in the Central region, as the Vedic tradition speaks through the lips of Manu and as it is evident from the analysis of the ordonnance of the Vedic text itself (vide also the chapter on the chronometry in the 2nd part.)

Area of the Vedic culture

One of the prospective names of the Proto-Indian Empire in antiquity was Meruka. This word meets in an encyclopedic work ‘The Great Composition’ (Bṛhat-Samhitā) of Varāhamihira (VII c. B.C.E.) as a ‘name of the country and its people.’ In addition, it meets in Middle East legends as Meluhha, a country, from which copper, gold, ivory was brought to Mesopotamia.

It goes back to the name of a sacred mythological mountain Meru described as the highest ‘mountain’ in the world, the World Axis. The heavenly Gaṅgā (the Lunar Zodiac) ‘flows down’ along its steep slopes, dividing itself into four streams (four quarters of the sky, the zodiac, the month.) Its star-spangled slopes appear in myths as if bejeweled with precious stones, its tops are compared with thrones of celestials, planets and incarnations of the New Moon, and it is proclaimed the celestial capital.

In the Vedic mythology, Sumeru (‘the Best Meru’) designates the position of the Sun on equator during an equinox, a ‘Center of the Universe.’ Therefore, the name ‘Meruka’ can be interpreted in this connection as ‘the Equatorial or Median Country.’ In all probability, ‘Sumeru’ is related to ‘Meru’, the name of a volcano close to Mount Kilimanjaro, which is located 3° south of the equator in Tanzania near the border with Kenya. The name ‘Kilimanjaro’ can be interpreted in Sanskrit as ‘giri’, ‘mountain’, Mandara. The mountain

Meru in Africa located almost on the equator a bit to south-east from the lake Victoria, a couple of centuries ago was the highest volcano on the planet, which after several mighty eruptions has decreased in size nearly twice. The toponymics of Africa, as well as mythology of ancient Egypt, have set of similar features with Sanskrit tradition. The name of the lake Nyasa, the river Congo and the Nile can be easily derived from the corresponding Sanskrit roots ‘nyasa’ (‘imposition of hands in tantra, depositing,’) ‘Gaṅgā’ (‘stream’) and ‘Nile’ (‘blue’ – typically one of the important inflows of the Nile is called the Blue Nile.)

Moreover, from geology it is known that the peninsula Hindustan once was a part of Africa. It points at primary prehistoric relationship of the ancestors of Indians and Africans. There is plenty of evidence of direct trading and cultural ties between ancient Indians and Africans on the East coast of Africa, at least, from the middle of the IInd millennium B.C.E. These are Indian zebu, cotton (imported cotton clothes were in demand in Egypt during the Roman period,) diplomatic missions, Buddhist missionaries and fighting elephants together with Indian trainers. The Egyptian merchant Firm according to S. Y. Berzina, acquired such wealth trading with India that even tried to become the governor of Egypt in the 3rd century C. E. Ancient Vedic Indians had the big merchant marine fleet equipped with the ships for long voyage. In Kingdom of Aksum (between 1st and 6th centuries C.E., now northern Ethiopia,) Indian gold coins of the Kushan epoch and a seal with Indic inscription were found. The Semitic language Gezez (scriptural and liturgical language of the Ethiopian Orthodox Church) preserved ancient Indian words for such concepts as ‘elephant,’ ‘sugar,’ ‘beryl’ etc.³⁵

The infinite fluctuation of the bright and dark halves of the year occurs due to the oscillation of the Sun relatively to the equator (Mandara,) as it is evidenced from the Vedic myth about churning of

³⁵ S. Y. Berzina, Ancient India and Africa. In: Ancient India: Historic-Cultural Ties, Moscow., 1982. P. 17-42. (In Russian.)

the the starry arch by the gods (months) with the help of the ‘snake’ of infinity (spiral way of the Moon.) The mountain Mandara as the World axis was placed on a dome-shaped amour of the Viṣṇu-turtle. The mountain Mandara was used by the devas and the asuras with the purpose of getting the planets and the ‘immortal’ (amrita) ‘drink,’ the light of the Moon, out of the ‘abyss’ of the night sky, as pearls from the bottom of the sea.

Mandara (equator) symbolizes in the Vedic mythology the origi-



Star-shaped temple in Somnathpur (Hoisala period)

nal ‘axis’ of rotation of the Sun and the other Planets, around which they move in respect to the stars through a serpentine road or in a spiral. The mountain was put on the back of Viṣṇu, personification of the sidereal Saturn, a planet with the biggest orbit in observational astronomy (vide Part II), who created a circle of 360° for the Sun, the Moon and the other planets. It follows that the mountain is a symbol of the Sun and its movement downwards and upwards relatively the heavenly equator.

Most likely, the Sumeru in the East designates the spring equi-

nox, and the Meru and Mandara in the West symbolizes the autumn one, after which nights become longer and more convenient for astronomical observation. The Southern tropic is called the island Lanka and is described as belonging to a demon Rāvaṇa, the brother of the ugly dwarf Kubera, the god of riches (the low winter Sun.)

According to excavations, the most part of Indus settlements was concentrated in the North-West India along the Indus River and the dried up river Ghaggar, but a part was located outside this region, reaching the South of India and the Central Asia. The ruin of the Indus valley cities under the sand of desert caused significant waves of immigrants in South-East and North-West directions.

The first wave of the European immigrants, in my opinion, was represented by Slavs, the most numerous Indo-European people speaking a Prakrit or a dialect of Sanskrit. The last one was constituted by gypsies formerly called Egyptians.

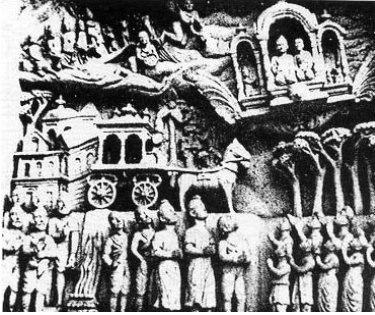


Indus statue

The word 'Slavs' goes back directly to a Sanskrit word 'śravaḥ' ('glory,') 'śravaka' ('Slovak,' 'novice,' 'scientist') or 'shravanam' ('hearing, popularity, glory, that, which is audible,' the 'Word,' the Veda) and was one of the self-appellations of the ancient Vedic people, meaning 'glorious learned educated people,' 'bearers of the Word or the Vedic knowledge.'

As it is clear from the etymology of their self-appellation, the ancient Slavs were educated Vedic people, whose wise leaders were not casually referred to as 'vedun' (from Skr. 'vedin, vidvan, vedavant,' 'teacher, Vedic scientist, brahman.')

As the Proto-Indian civilization was the progenitress of a long line of the majority of Indian, Asian and European civilizations, and



Vimana on a bas-relief in the Ellora cave temple



Migration of Gipsies



Shankara

a major body of migrants, and, hence, aboriginals, consisted of Slavs or bearers of the Vedic culture, it should be named more correctly Glorious or Educated Vedic Empire (Shri Vaidic Dharma.) ‘Dharma’ (in Slavic pronunciation ‘derzhava,’ ‘the lawful order,’ ‘the state’) is the term incorrectly interpreted as ‘religion.’ Actually, it means ‘state’ and ‘polity,’ ‘world order’ or ‘Kingdom of Heaven,’ expressing an ancient astronomical notion of the Lunar world as the unique and true state of all humankind – the law, ethics, religion in modern sense are only parts of this concept.

One of the false historical representations of the ancient Slavs is the statement that they were nomads initially living in poor Euroasian steppes that pushed them to constant struggle for means of subsistence, made them unpretentious and aggressive, and in combination with the absence of cultural history, the breadth of steppes caused formation of the concept of a ‘wide Russian soul,’ military arrogance and the very self-appellation ‘Excellent’ and ‘Noble’ (Ārias.) Here, all and everything is inexact or simply erroneous, including one-sided translation and interpretation of the word ‘Ārias,’ which first of all meant



Air photograph of a Proto-Indian city

‘bright, ardent adherents of the Moon, astronomy, mathematics, reason and education.’

Their religion reflected in the Vedas was ostensibly the worship of the aggressive god of thunderstorm Indra, from whom they wanted only military victories. Is really the mythological image of Indra so simple and unequivocal? (See ch. on the astral Vedic religion.)

It is almost certain that the ancient concepts of one community transformed by the others cannot be considered as the proof of their low or ignoble origin. A number of high Vedic concepts in Iranian cosmopolitan environment (in which a considerable role was played by the ancient Persians who called themselves Ārias, Semitic and other peoples of the Near East and Central Asia) lost their initial high signification and got quite often the opposite meaning.

So, the word *deva* (‘a celestial,’ ‘a god’) began to designate a wood monster, the word *Dyauh* (‘Day,’ ‘Divine,’ ‘the marvelous, bright Sky’ of the full moon night) turned to ‘Devil.’ The Vedic image of *Dyauh* has not only Greek parallels (Zeus, the head of the gods or luminaries, the planet Jupiter,) but also Latin (*deus*, ‘god,’) Lithuanian, Russian (‘Div,’ ‘divine, marvelous being’) and even English (*divine*.) The word ‘*satana*’ (‘saint,’ Buddha, Śiva) turned to ‘Satan’ (an infernal monster,) whereas *asura* (‘dark,’ ‘not-god,’ the

adversary of the god) turned to 'god.' Similar process of transformation of senses in their opposites is characteristic of Greek-Christian opposition, Byzantine-Roman and Roman-Catholic-Protestant. It is inherent in general in any split.

It is a matter of considerable bewilderment, when pro-Western researchers speaking about the ancient Aryans, whose homeland was allegedly Russian steppes, note only language parallels between Sanskrit, Greek, Latin and English. Whereas any important Sanskrit concept finds the best reflection in Slavic, first of all Russian and Byelorussian languages! For example, Aryans addressed their leaders with a title *rājah*, *rājar* (Lat. 'rex,' 'king,' English 'regal,' 'imperial,' 'Sir.'). As though there are no Russian and Byelorussian parallels, such as 'uryadnik,' 'ryadets,' 'vladyka,' 'uladar'!

Usually it is affirmed that somewhere in the first centuries of the second millennium B.C.E., they started to migrate to the South, whereas, actually, migration began from India towards Iran and Russia.

Moreover, noting that in the north of Europe, there is a country, which name contains a hint on a word 'Āria' – Ireland – the pro-Western researchers inconsiderately assert, that Ārias, having moved to the South, enthralled Iran and gave it the name, which is going back to the same root. Why then did not they give this name to their own imaginary ancestral home – the Russian steppes?

One of such researchers directly states that, having invaded India, 'these self-satisfied nomads' (they were initially robbers, instead of farmers, he emphasizes) 'imposed to it the cult of aggressive Indra, destructor of cities,' caused, certainly, indignation and resistance of builders of Proto-Indian cities, destroyed all the country and, paradoxically, forced it to worship blindly their gods-destructors!

In addition, he argues that conquerors, having occupied the true paradise, the coasts of the Ganges, were more prompt, than founders of the Indus cities (which, by virtue of some inexplicable reasons, had remained stuck to the Indus Valley having turned into desert.)

Why could not inhabitants of the Proto-Indian cities retreat under the impact of pseudo-Aryans to the banks of the Gaṅgā? The statement that Proto-Indians with their advanced technology could not cope with the Gaṅgā's woods and that the 'epic task' was carried out by nomads, 'who adopted almost nothing from Proto-Indians,' were not interested neither in agriculture, nor in construction, neither in state, nor in education,' lacks just common sense!

When the 'nomads with tribal organization conflicting among themselves' hypocritically and contemptuously are proclaimed the founders of the Vedic civilization and are described as a basis of a later territorial-tribal states known as jana-padas (democratic republics) or jana-rājya-padas (aristocratic republics,) 'among which Indians number themselves even today,' nothing remains but to make a helpless gesture. It is not possible to make comments on such confused balderdash (it is not a scientific term,) in any way, this kind of reasoning cannot be called science of history.

The Rigvedic period arbitrarily and without the slightest proofs was attached to 1700-1000 B.C.E. by the historians of the Sanskrit literature. The Ṛg-Veda was called an assembly of religious verses reflecting a primitive layer of Indo-European religions, purportedly focused on sacrifices to gods. The social structure of this speculative society is depicted as gradual sophistication of the structure of two initial classes – noblemen and commoners – to three (with addition of dasas, ostensibly 'dark' or even 'black' ones,) and then to four (catur-varṇa, 'four colors,' including brāhmaṇas, kṣatriyas, vaiśyas and śudras.) Then this 'multitribal' milieu started to fractionize again forming a conglomerate of jatis (clans and tribes.) Thus already during the Vedic period, – a sample of reconstruction of history with the help of ventriloquism – class structure became completely rigid.

Migration of the Aryans to Gaṅgā took place (how not to be amazed with a marvelous accuracy?!) in the late Vedic period called 'the period of Brāhmaṇas' (1000 – 500 B.C.E.,) which were the commentaries to the Vedas ostensibly written one thousand years after the

Vedic hymns (1000 – 850 B.C.E.) and which began to dominate over the religion of the Aryans. The late Vedic period is also named the ‘Epic one’ though Mahābhārata and Rāmāyaṇa belong to the period 500 – 200 B.C.E. Not philosophizing crafty, mythological heroes of the poems are given for the certain historical figures allegedly having lived during this period, moreover, having confessed a mix of the Vedic and other beliefs.

Aryans, according to Protestant descriptions, which have migrated into modern historiography, lived in an unpretentious way as it becomed to pagans: loved music, singing, dance, poetry, gambling... Perhaps, these were their main occupations! Where is the good of talking about construction of vimānas (balloons or airplanes) depicted on a bas-relief of the Ellora cave temple? However, there are counterarguments that are even more unpleasant to anti-Aryans.

Dr. Richard Thompson in a paper ‘Anomalous Textual Artifacts in Archeo-Astronomy,’ points at that ancient artifacts can survive within written texts, as well as within the strata of the earth.

He points at textual artifacts that seem too advanced for the historical period of the Vedic texts reminding remnants from an earlier, advanced civilization that is lost to historical memory. ‘They are: (1) Accurate values of the diameters of the planets, Mercury, Venus, Mars, Jupiter, and Saturn, as found in the Indian astronomical text, the Sūrya-Siddhānta. This information can be found in a manuscript dating to C.E. 1431, long before modern knowledge of planetary distances and diameters was acquired using telescopic observation. (2) The geocentric ring system described in the cosmological section of the Bhāgavata-Purāṇa correlates closely with the distance of the Sun from the Earth and with the geocentric distances of Mercury, Venus, Mars, Jupiter, and Saturn. The traditional date of the Bhāgavata-Purāṇa is about 3,000 B.C.E., and some scholars date it to the 10th century C.E. Either way, this is long before the development of modern astronomy.’

This scholar affirms that the patterns of correlation found in

(1) and (2) can be shown to be statistically significant. And he ‘discusses these correlations in relation to the controversial claim that there existed an ancient civilization with advanced astronomical knowledge.’



The skeptic argues: ‘The pseudo-Aryans did not love fine arts and letters, though inherited them from Harappans! They started to be interested in literature somewhere during the period

from the 650 to 500 B.C.E., but written documents from early Harappan times (2500 – 1750 B.C.E.) up to the Mauryan epoch (300 B.C.E.) were not apparently preserved.’ Then, the Brahmi script appeared as a sine qua non loan from the West. The ‘militarized Aryan religion evolved into a softer ceremonial and meditative form.’ I feel nothing but scorn for such poor argumentation. The ‘militarized’ Aryans – we can add not without a derision – produced a unique ethics based on such principles as nonviolence and truthfulness, dialectical and formal logic, yogic psycho-physiology, about which L. Tolstoy said that we are still very far from the Hindus in this area, and so on and so forth.

To tell the truth, pseudo-historians are not at all excited about yoga and ethics – they do not have, as a rule, any knowledge of these disciplines and so revel in ‘cheap politics,’ ‘publicity’ and ‘objective’ infallibility. Objective researchers are easily transmogrified into equitable incorruptible judges, confessing just religion of their sectarian class (party, nation, race or other group) struggle being unobservant of the history’s and logic’s laws! But ignorance of the law is no excuse.

The word ‘Veda,’ as it has been noted above, means ‘knowledge, science, wit’ not only in Sanskrit, but – that is significant – at least, in

one European language, Byelorussian belonging to the Eastern Slavic group of the Indo-European family. As far as I know, Byelorussian keeps a word 'Veda' in the sense of 'science' from time immemorial (the correspondent word in Russian is 'vedenie' as, for example, in the word 'prirodo-vedenie' ('nature study,') 'Wiesen' in German, 'Wetten' in Dutch, 'wit,' 'view' in English.)



Undoubtedly, the Byelorussian 'veda' is not a loan word. It is one of many thousand tadbhava (Sansk. 'of the same sense,' 'similar') and tatsama ('the same,' 'identical' to Sanskrit) words inherited by Slavic languages from Sanskrit and forming a nucleus of Slavic languages. The word 'Byelorussian' ('white Russian) goes back to Sanskrit words bhāla 'bright, light, the Sun, the Moon,' and rasika, rasin 'beautiful, having aesthetic taste, the judge of art and beauty,' which are met across the Vedas. The concept of 'White Russia' corresponds to an image of 'Saint Russia' and also to the 'White Country' of the Iranians.

Unfortunately, a huge linguistic material of Slavic languages and the Sanskrit-Slavic linguistic parallels, revealing the most ancient

meanings of such words as ‘Veda,’ ‘Āria’ and great variety of other more specific concepts, are only insignificantly taken into account in Indo-European comparative studies. Perhaps, except for a small tract devoted to comparison of Sanskrit and Russian words, and a few original historisophic works by A. S. Homyakov written yet in the XIXth century, there are only some sketches and dissertations in modern Russian indology favorably touching upon this prominent aspect. As the result, many pro-Western indologists, being captivated by shallow etymological theories, object as if in a big confusion: If Ārias (allegedly, some ethnic group) moved from India to Europe (they mean only its Western part,) then, where is the linguistic ‘bridge’ between these two subcontinents?!



The Sanskrit word *rasinah* (from which the word ‘*russich*,’ ‘*Russian*,’ and a surname ‘*Razin*,’ and such concepts as ‘*razit*,’ ‘to smash,’ ‘*vyrazitel*’ *nost*,’ ‘expressiveness,’) being a surname of Indra, and, hence, of his admirers, aesthetes, scientists, astronomers and programmers of ancient India meets repeatedly in the Vedas and other Vedic texts, according to the ‘*Vedic Concordance*’ of M.

Bloomfield (1906.)³⁶ For example:

pariṣkṛtasya rasina iyam āsutiḥ (RV.8.1.26c; SV.2.743c) – ‘for *Rasin*, the amateur of the esthetical nectar-expressiveness, this sap;
pibā sutasya rasinaḥ (RV.8.3.1a; SV.1.239a; 2.771a; AB.4.29.15; 5.6.7; 16.28; AA.5.2.4.2; AŚ.5.15.21; 7.12.7; ŚŚ.7.20.6; 12.7.5; 9.11) – ‘taste, *Racin*, the essence...’;

saṃ yanti rasino rasāḥ (RV.9.113.5c) – ‘saps-beams and essences of aesthetic pleasures... converge at *Racin*.’

These etymologies point at ‘*Rosses*, *Russichis*, *Russkies*, *Ros-siyanes*’ as an originally educated Vedic people, the bearer of a complex of Vedic sciences and arts, confessing the astral esthetical

³⁶ Maurice Bloomfield, *A Vedic Concordance*, Cambridge (Mass.), 1906.

religion, worshipping light (planets and stars,) science, knowledge and education in a broad sense. Therefore, their way to Europe is marked by the names of three rivers, which are called Rasa (in India,) Raha (in Persia) and Ros' (inflow of the Dnepr,) all meaning the Zodiac. Dnepr's toponymics and hydronymy bears eloquent testimony to Sanskrit beliefs of ancient Slavs as it was revealed by O. N. Trubachev and substantiated by my own observations.

In view of insufficient development of Sanskrit Studies in Russia



and the majority of other Slavic countries (in Belarus they are in embryonic state and are deprived of any attention on the part of the state,) the strange situation has been created, in which not only the fact of close relationship of Slavic languages with Sanskrit, in relation to which they actually are dialects, is ignored, but is not noticed in an emphasis or, at least, does not find correct judgment that these languages are dominant from Pacific Ocean up to the Alps. Moreover, the core of the Western languages is Slavic grammar and vocabulary. In order to hide this relationship, the term 'Indo-European family' was invented, in which the

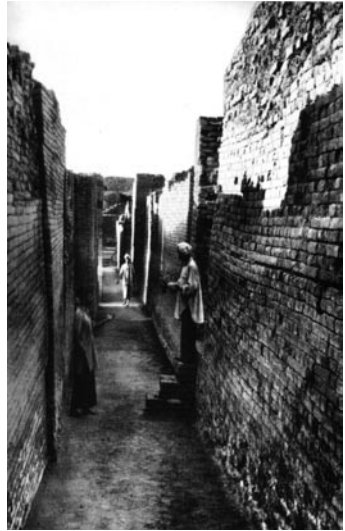
role of the Slav Vedic language seems to be peripheral instead of being the central one.

Major Slavic languages as, for example, the Church Slavonic, spoken by Southern Slavs in the Byzantine Empire, Ancient Russia and Bulgaria (ancient Bulgarians are more and more persistently identified now as an Iranian or even Indian people,³⁷ which migrated

³⁷ Dobrev, Petyr. Bylgarskite ognišča na civilizacija na kartata na Evrazija (Fires of Bulgarian civilization on the map of Eurasia), Sofija, 1998. (In Bulgarian.)

from the areas, adjoining to the Northern Pamir, India and Iran,) represent simply dialects of Sanskrit. Russian and Byelorussian are so close to it that sometimes thousands of words and expressions can be understood without translation. It is absolutely clear that exactly the Slavic languages form the ‘linguistic bridge’ between the Indo-Aryan, the Iranian, on the one hand, and the Baltic, the Celtic and the West-European languages.

The concept of ‘indestructible glory’ (Sansk. Śravas akṣitam, akṣiti śravah,) having parallels in Greek (kleos aphiton) and Russian (nerushimaya slava,) represents, in the opinion of a comparativist A. Kuhn, as observes E. Y. Elizarenkova, an Indo-European poetic formula.³⁸ Kṣemendra (Shivaite philosopher and poet of the XIth century) names glory a ‘true immortality,’ explaining that a person is alive until a remembrance of him is preserved among living compatriots. It is obvious that Slavs had chosen this word as their self-appellation not casually. It emphasizes their communion with the most secret heritage and beliefs of the ancient Indians, founders of the Vedic civilization.



They appeared in Iran, later in the Western and Central Asia, the Southern Siberia and on the Russian plain along the big Russian and European rivers during the postglacial period, say, five thousand years B.C.E., having been chased from the highly civilized and densely populated region of the Northwest India by continuously worsening ecological conditions.

Prof. B. B. Lal, former Director General Archaeological Survey

³⁸ Elizarenkova T. Y. *Yazik I Stil Vediyskih Riši* (Language and Style of the Vedic Rishis). Moscow, 1993. P. 4. (In Russian.)

of India, has shown that Kalibangan in Rajasthan has given the evidence, perhaps, of the earliest archaeologically recorded earthquake, which occurred there around 2600 B.C.E. and brought to an end the Early Indus settlement at the site.

B. B. Lal further argues: 'It may be stressed that it is not just the number or extent that matters. What makes the Indian discoveries so important is that they have added new dimensions to the basics of



this great civilization. For example, Lothal in Gujarat has brought to the light the earliest (ca. 2500 B.C.E.) dockyard known to humanity. Kalibangan in Rajasthan has given the evidence of the earliest (ca. 2800 B.C.E.) ploughed agricultural field ever revealed through an excavation.'

'Kalibangan has also thrown up evidence of a new kind of ritual associated with a cult of 'fire alters.' It has also brought to light stone pillars which are almost as highly polished as the well-known Ashokan pillars 2000 years later. The colossal copper figures recovered

from Daimabad in Maharashtra are indeed unparalleled in the entire gamut of protohistoric art of the subcontinent.’

Lal insists on that ‘this civilization cannot be regarded as an import from Western Asia, as held by some scholars in the past. It is now clear that it had an indigenous origin and development.’

By the way, repeated mentioning in the Vedas of puras, ‘strongholds,’ cities-fortresses, including ‘iron’ ones in a mythological context should not cause any ambiguity: the composers of the Vedas were well familiar with cities. This is testified by advices to address the purapati (‘town governor’) concerning private questions. At the same time, an appeal to Indra to destroy cities of the malicious governors does not give at all any reason to assume that the Vedic wise men lived outside of cities and settlements and represented nomads, which leader waged wars against the townspeople. Indra lives in grandiose heavenly hailstones Indraprastha. Today, Hindus are confident that Delhi was constructed on its place.

Typically, the Vedic immigrants went to Europe as builders of states and cities. Some of their extremely big ancient states in the Western Asia were Iran, Hittite empire and then Persia. On the Russian plain, they created the state, which north-west part was named Gardarika by the ancient Scandinavians. A big number of small cities going back to the fourth millennium B.C.E. is dug out on the Russian plain. Some of them, as, for example, Belsky Site (VII-VI centuries B.C.E.,) located on the river Vorskla, inflow of the Dnepr, reached the size of Moscow of the XIXth century (40 km², the perimeter of the walls was 30 kms.)³⁹

Most likely, the struggle of Indra against fortresses reminds the struggle of medieval European kings against feuds. It simply shows that in the country of the Vedic wise men arbitrary actions and despotism of feudal lords was treated as plain negation of order and justice and the central governor similar to Indra-Soma-Agni,

³⁹ Rybakov B. A. Paganism of the Ancient Slavs. Moscow., 1981. P. 537. (In Russian.)

i.e. to the Moon, emperor of the celestial Universe, suppressed all splits, revolts and displays of petty tyranny of vassal governors. The uniform system of various (measuring, architectural, linguistic and other) standards on all huge extent of the Indus civilization points at strong imperial rule.

Immigrants carried with them except for language and literature also technology and standards, sciences and arts, calendar and mythology, philosophy and spiritual knowledge, political principles of true democracy and wise diplomacy, which they had developed in bowels of the Vedic civilization in India.

Undoubtedly, these Vedic and Buddhist immigrants or 'Slavs,' who moved in several waves to Europe from India, were the main founders of the Iranian, Slavic, ancient Greek, Latin and Celtic civilizations.

Modern Slavs are, certainly, regardless significant ethnic mixtures as among themselves so with their neighbors, their straight most close descendants and cultural heirs. They represent until now a primary factor of stability in Asia and Europe, the most technologically and spiritually advanced nations in the world.

I am sure, that eventually the correct view will triumph, and the modern contribution of Slavs to the Indo-European or Vedic cultural heritage and world political process, at last, will be recognized and will be seen in a correct Vedic historical perspective. Incorrect perspective, consciously or subconsciously supported by the academic circles, sanskritists, indologists, Vedic scholars, and culturologists, historians and politicians, helps those who aspire to break the Indo-

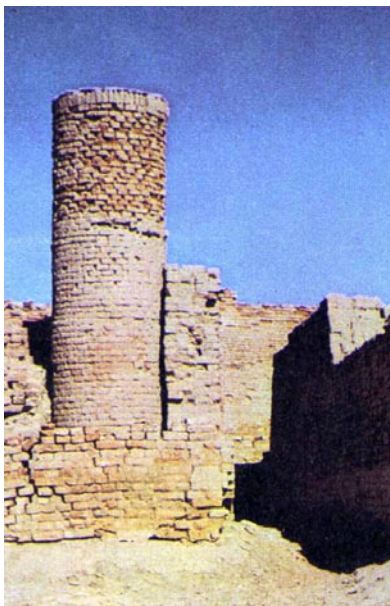


V.M.Vasnetsov The princesses of the Three Worlds

European cultural unity, which is a real basis of the future global civilization.

Pro-Western historians quite often kick not only Slavic civilizations: haughty mockery touches the ashes of the founders of the Proto-Indian civilization as well, which could not be in any way characterized as backward and primitive. It had some standards, which Europe did not know until the last century, and its script is not deciphered by the European wise men regardless one hundred years of effort.

The Indus civilization which had been discovered in the 20-th of the XXth century, was obstinately attached only to the Indus Valley. Thanking, mainly, to the efforts of the Indian archeologists, it was found out that it was covering almost the whole subcontinent. It was present in adjoining regions of Afghanistan and Central Asia, as it was shown by Russian and Soviet archeologists.



Ancient Indian well

However, even now, when its age has become considerably older, pro-Western scholars try to deduce the civilization from any precedent rural settlements, as if rural organization, being always synchronous with cities and state, can be considered as a progenitress of astronomically focused cities, temples, etc., exact mathematical-astronomical knowledge, spiritual culture with its ethics, aesthetics, logic, philosophy, linguistics and other refined scientific and artistic disciplines!

The Vedic city civilization with advanced writing system was labeled ‘Harappan’ by non-Indian modern name of one of the first dug out settlements.

'Indus' cities such as Harappa, Mohenjo-Daro, Chanhu-Daro, Kalibangan, Banawali, Lothal, Rupad, etc. were characterized by much higher organization, than the settlements of the corresponding period in Mesopotamia and Egypt. Streets were straight, the basic ones were wide and were crossed under right angles, houses were built of burnt brick, and the system of waste channels and water drains was well thought out and was hidden under the road covering.

The agriculture was based on the use of a wooden plough, which, as it is known, is the most suitable for droughty regions. They raised barley, wheat, cotton, vegetables, and fruit. Cats, dogs, goats, sheep, cows, pigs, camels, elephants have been domesticated.

Various ores were extracted in mines, and nonferrous metals, bronze and copper were widely used. Iron was, undoubtedly, known. However, historians instead of simply ascertaining that iron products have not reached us, usually hasten to draw a conclusion based on etymological tumbles that iron was not known.

Buildings, many of which were higher than two floors, had a good layout. They used for their construction a kind of gypsiferous cement, which could be used even for fastening metals. Fast dyes were known. The hydraulic constructions similar to the big pool in Mohenjo-Daro were marked with ingenuity and at times with scope as a dock in Lothal. The pottery was made of thin grounded and well-burnt clay.

The Vedic cities had trading ties with Afghanistan, Persia, Egypt, Mesopotamia, Africa, Indonesia, Easter Island, and, probably, with ancient America. In contrast to the above-mentioned countries, cities in India had a housing scheme without opposition of rich and poor areas. Equality was the main ethical slogan of the Vedas, that is, of the celestials, devas and ṛṣis, who were the symbolical 'governors' of the academic cities.

The large river parallel to the Indus had completely dried up at the end of the second millennium B.C.E., having given up the place to the Thar Desert. Greek geographer and historian Strabo (63?

B.C. – A.D. 21?) tells in his ‘Geography’ that according to a Greek Aristobul, who had returned from India, a large country had been abandoned by its citizens, because Indus had left its riverbed and flowed rapidly like a waterfall.

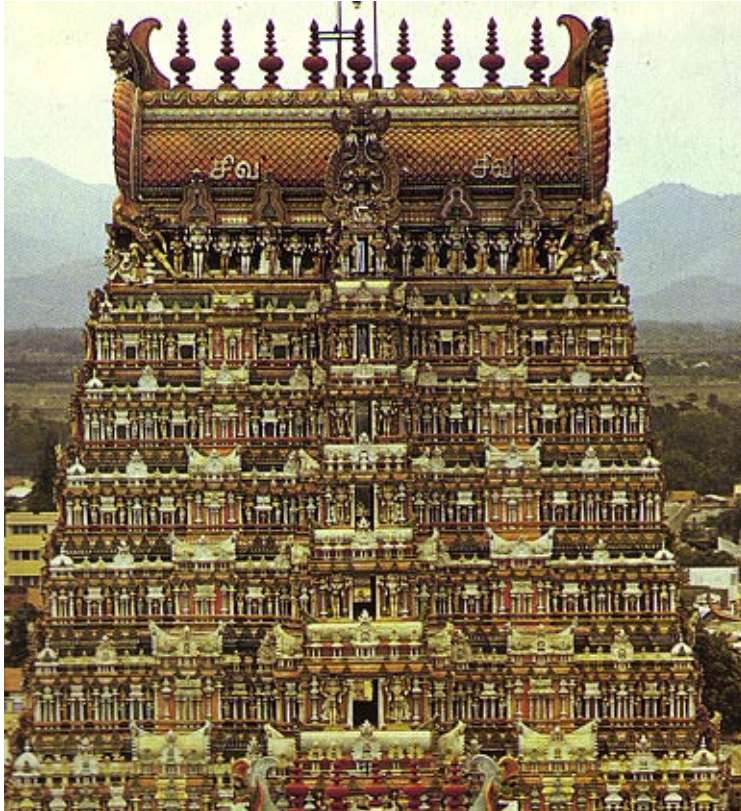
Finally, the inhabitants of the comfortable cities were compelled to abandon them and moved to the South, the North, the East and the West. Migration began thousands years B.C.E. , so, according to the prevailing dating, to the beginning of the first millennium B.C.E., the Indus cities were completely deserted. A part of immigrants moved into the Gangetic Valley and farther to the Southeast Asia, Indonesia and Oceania, but the significant part was compelled to move to the Near East, to the Asia Minor (where during this period a number of Indian governors appeared,) the Central Asia and the Russian plain.



Krishna and Radha

7. PHILOSOPHIC (ADHYATMIKA) INTERPRETATION

In India, the Vedas until now are surrounded with an aura of



sanctity and infallibility as the greatest scientific books of the universe. On belief of Mahesh Yogi, the ideologist of the international educational movement of ‘transcendental meditation’ and the ‘World State of Global Peace,’ they are the scientific constitutions of cosmos created on the basis of the unified field theory.

The majority of Hindu believers do not investigate at all the

content of the Vedas, believing that they embody a divine truth in its completeness, and, trusting that everyone who has simply touched these books is already marked by divine good fortune. The Vedas, on general belief, represent a superhuman wisdom, spirituality and universal law. This knowledge is frequently linked to ‘mysticism,’ a mysterious science of spiritual clairvoyance and thaumaturgy.

Rapturous and full of trepidation Western neophyte girls and guys, admirers of theosophy or fantasy, are visibly inclined to interpret literally each metaphor and symbol, seeing in these books great revelations of a cosmic civilization. But also, the most part of modern practitioners of Religious Studies and spiritual pastors gravitates to a mystical or religious interpretation. They ambiguously and inexactly qualify the Vedas as depositories of ‘religion’ and ‘mythology’ of the Vedic ‘Aryans.’

Some principles of Vedic education were adopted by the antique encyclopedic education, then, by Christian philosophy. Jan Amos Komensky, the author of the ‘Great Didactics,’ referred to opinions of Indian yogis. Since classical Sanskrit texts became accessible in traveller’s accounts or translations in European languages, they found a vivid response in Europe and later in America.

The Vedas excite imagination of philosophers and mystics, among whom A. Schopenhauer declared that Upanishadas are his consolation in life and death. Principles of ethics kept by Slavs in Russia and Hindus in India, formed the basis of the ‘doctrines of life’ of Leo Tolstoy and Mahatma Gandhi. Such modern thinkers as Leo Tolstoy, Mahatma Gandhi, Albert Schweitzer, and such scientists as Albert Einstein and Ervin Schrödinger, highly eulogized the Vedas.

Let us notice that the ‘global ethics’ of L. Tolstoy is not similar to modern artificial systems developed in different countries by thinkers of atheistic and religious breed with purpose of camouflage or justification of the Western political substitutes. True global ethics is moral philosophy, which encompasses all deep levels of human psyche and spirituality, and, the main thing, incorporates vital and

moral experience of self-control, harmonious development and self-improvement of all peoples at all stages of their existence.

The modern thinkers inspired by the Vedic ideas of natural spontaneity, general unity and harmony, cherish an idea of the future scientifically organized civilization based on principles of global ecology and ethics.

The Indologists also are fully aware of the fact that the Vedas conserved and transmitted the intellectual movements of wide spectrum and of high scientific value. But they are more moderate in their appreciations.

For example, T. Y. Elizarenkova calls attention to the fact that the Ṛg-Veda, though forming the great beginning of the Sanskrit literature, 'in no way may be compared to a feeble streamlet, which had formed in due course a big river. It is more like great magnificent lake, which astonishes much stronger than what had sprung up out of it.'⁴⁰

Philologists, literary critics, philosophers and historians of naturalistic orientation usually think about the Vedas as monuments of ceremonial literature of the early Indo-Europeans marked with eclecticism and some exotic and weak gleams of philosophical inquisitiveness. Their philosophical doctrine is quite often proclaimed to be primitive, based on magic, self-hypnosis, and sorcery or simply cheating and swindle of priests. The Vedic sciences are represented in the history textbooks extremely schematically if at all get in sight of the majority of 'indologists.'

Thus, as a rule, the Vedic 'Holy Scripture' is opposed to the modern science and its origins are proclaimed either 'supernatural' (divine) or 'unnatural,' such as a plot of priests,' plunder of a civilization-progenitress by the invented conquerors, Aryans, ostensibly represented as ancient European nomads.

⁴⁰ T.Y. Elizarenkova, Rigveda: The great beginning. In: Rigveda. I-IV Mandalas. Translated into Russian by T. Y. Elizarenkova. Moscow, 1989. (In Russian.)

Max Müller (see below,) who could not find any system in the Vedas, invented an eclectic theory, which affirmed a ‘henotheistic’ character of the Vedic gods considering the assembly of Vedic mythological characters as an amorphous chaotic crowd of heroes and deities, in which each god is eulogized as the supreme.

On the head of fanatical adepts be this belief in a divine origin of ‘sacred texts.’ The illiterate atheists professing militant godlessness can just assert a plot of priests. The invention of ‘Aryans-nomads’ was necessary to English and then to German racists for the justification of their craving to enthrall peoples of India and Russia. Actually, ‘Ārias’ in the Vedas are ‘bright’ moonlit nights, Moon’s companions (Indra with his divine singers,) and through metonymy – educated ‘ardent’ adherents of the Lunar observation, astronomers-philosophers. Russian parallels do not leave in this behalf any doubt. The fairy tale about aliens is necessary for those who have not read K. Tsiolkovsky’s philosophical articles devoted to mysterious reasonable forces of space and cosmic ethics, and even has not understood that we are children of space and ‘members of one space crew’ – the Earth – in words of Antoine de Saint-Exupery, 1900–45, French author and aviator.

Leo Tolstoy



I would like to pay a special attention to L. Tolstoy’s little-known statements about Indian ethics and religions selected by me from his letters to his Indian friends. They gave a strong push to my study of Sanskrit and Sanskrit philosophical and scientific heritage. The great ‘teacher of life’ had Indian religion, philosophy and ethics in great esteem.

‘I compose a series of books,’ he wrote, ‘with exposition of all big world religions, whose essence in all religions is always the same.’

It is quite natural that religion of the Vedas as one of the most ancient and deepest occupies the first place in this series. I want to make a selection of the brightest and deepest sayings from the Vedas.’

‘I consider the doctrine of the Buddha true and always highly praised it. The religious understanding of life is especially clearly expressed in the true, non-perverted teaching of the Sakya-Muni Buddha.’

‘These days, I have been translating and adopting for children sayings of Kṛṣṇa, Brahmanical incarnation of God dated before Christ. How not to be pleased scooping from this source and uniting in God with millions of people who lived thousands of years ago and are living now? How a Hindu cannot be pleased, when he or she reads verses of the Gospel? How people cannot be pleased knowing that they can, using what everyone does in this business, move closer and closer to knowledge of God and to execution of his law?

A legend about Kṛṣṇa and his doctrine serve as fine confirmation of the same eternal truths, which were later preached by Christ in the Gospel. I firmly believe in the main statement of the Bhāgavadgītā or Song of the Lord Kṛṣṇa that a person should direct all his spiritual forces to performance of his or her duty, or, as I express it, on his life in order to love people and not to think about consequences of it, knowing that, if to live according to such a law, the best results for a person and for the whole world will be achieved. I always try to remember it and to act according to it, and also to tell it to those, who ask my opinion, and to state it in my works. I cannot think differently, if my outlook is truly religious for this principle is the true basis of religion. And religion, true religion, always was and is everywhere the same.’

‘The idea of some Hindu brothers and friends that I am an embodiment of Kṛṣṇa is dear and pleasant to me. However, undoubtedly, this is an exaggeration of my personality.’

‘When I have finished reading the book ‘Kṛṣṇa – God of Love’ by Surendranath Mukherji, I was under such strong impression that

I have vividly felt brotherly, spiritual unity of all living world. The philosophical, religious idea of Kṛṣṇa is an eternal and world source of all religions and all philosophical systems.’

‘The religion of Kṛṣṇa, common to all people, can and should unite all mankind in the same belief and in the same rules of conduct based on it. The humankind should be united in the same belief because the human soul only seems to be diverse and various in each separate person, in fact, it is one in all beings. That is why, I have left aside my national traditions and personal predilections and I expound only the great world truth of the religion of Kṛṣṇa.’

‘I have sacrificed my poetic propensities for that great purpose, which was put before us by Kṛṣṇa: to comprehend and to realize that unique basic truth – love – which can unite people. To work for achievement of this great purpose, I think, is my calling and duty. For many years, I tried to work in this direction and, if the rest of my life can be useful for something, it should be dedicated for the same work.’

‘We prepare for edition select Upaniṣadas, Tantras, Purāṇas, sayings of Buddha, Kṛṣṇa, Shankara, Ramakrishna, Vivekananda, Abhedananda, S. Mukerji and M. K. Gandhi, whom I very much appreciate.’

‘I am very much interested in India and deeply respect the Indian religious wisdom. In recent times, many Indian writers began to acquaint Europe with deep wisdom of the Hindus. I receive two Indian magazines ‘The Vedic Magazine’ issued by Rama Deva in Kangra in India and ‘Light of India’ issued by disciple of Vivekananda S. Mukerji in the USA. Yesterday, I have received a letter from a young Hindu Mahatma Gandhi with enclosed new edition ‘The Indian Opinion’ having for its object struggle against materialism and preaching the Vedantic truths.’

‘Extremely interesting letter of Gandhi has rejoiced me a lot. God bless our dear brothers – Hindus – in Transvaal! The same struggle of soft against rigid, humility and love against pride and violence is

becoming more and more vivid here in Europe, in particular, in one of the sharpest collisions of the religious law with the profane one – in refusals of military service. Refusals become increasingly more frequent.’

‘Gandhi’s letters and his biography have very much interested me and enabled me to learn him better and to understand and estimate his activity.’

‘With big interest have I read the Gandhi’s book ‘Self-Government of India.’ I think that question, which is discussed by him – passive resistance – is a question of greatest importance, not only for India, but also for all humankind. Gandhi has heard my appeal to India – ‘Letter to a Hindu’ – and has founded in South Africa a colony of my name. They recognize the moral-religious law of non-resistance to harm by violence and, the main thing; do not participate in violence in any form. The English government very strictly pursues them, obviously, feeling, as it can not be otherwise, in those people believing in the law of love, not admitting violence and participation in it, the main danger.’

‘With big interest and benefit for my spiritual life, I have read all Indian religious books, which have come to me. In 1896, I was acquainted with rāja-yoga through a remarkable book by swami Vivekananda ‘Philosophy of Yoga.’ The doctrine of yoga is excellent. In this area until now, the humankind stands very far behind Hindus. Such true, high and clear understanding of life makes Vivekananda the true leader of humankind.’

These ideas are taken from L. Tolstoy’s letters to Mahatma Gandhi, Bishen Narain, Tod, Chitel, Rama Deva, Baba Bharati (S. Mukerji,) from letter-appeal to Tarkuat Das and to some other persons.

Maybe, some Tolstoy’s estimations are unilateral and out-of-date, but as a whole, they show better than anything else how important the study of the Indian ethics was to him. These estimations were a starting point of my systematic study of a huge spiritual Sanskrit

heritage of peoples of India, a source of inspiration and important methodological principles.

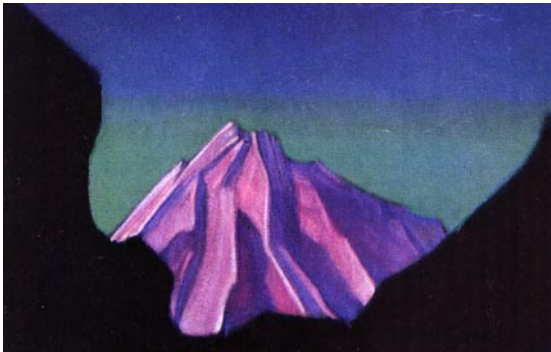
The reconstruction of harmonious universal ethics will be carried out in the future namely on this way of large-scale research of ancient Indian ethics in the context of its influence on many countries and peoples during many epochs, which was undertaken by late Leo Tolstoy, who embodied it in a multivolume series of ethical anthologies ('The Circle of Reading,' 'On Every Day' and 'Way of Life,') philosophical works and articles.

In Soviet period, this work was stopped and the history of Indian ethics found only reflection in academic studies of A. M. Samozvantsev devoted to problems of sociology and law in texts of 'Artha-Śāstra' and 'Dharma-Śāstra,' academic researches of vedānta by V. S. Kostyuchenko, A. D. Litman and some others. Whereas in the Soviet period, a large set of translations from all Indian languages was published, that area, in which India has preserved the most extensive material and has made the most powerful contribution – the scientific literature, the Vedic philosophy, mythology and universal or global ethics – has been investigated poorly and, mainly, from the descriptive and critical point of view. It is no wonder, for Indian philosophy had been enlisted in the category of 'idealistic' bourgeois ideology. Even such 'innocent' word as 'ethics' until it had not appeared in the Program of the CPSU in 1961, had been withdrawn from a public lexicon. Last 30 years of the Soviet period, the word 'ethics,' mainly, had been used in the works, which you cannot name philosophical by virtue of their extreme politicization and propagandist publicity. If they mention ethical issues, they do it not in the sense of a doctrine about deepest attitudes of a person to the world, eternity, truth, justice and other lasting values. They mention them in the context of 'etiquette,' a set of tactical rules of conduct, that is, in the sense of internal regulations or 'careerist statute.' ETHICS loses its inborn sense put in the word 'ethos' in Ancient Greece ('deep moral-spiritual foundations,' 'true fruits of the garden of knowledge

and education protected by logic and fed by physics,) or in India in the word 'Dharma' (state-space law-ethics-credo or a foundation of the world order in the Solar universe.)

B. L. Smirnov

Quite often, the successes of Sanskrit Studies were determined in Russia by the enthusiasm of scholars than by purposefulness and reasonableness of the work of the Academy of sciences. Huge work in the field of studies and translation of philosophical texts of the Mahābhārata in parallel with the academic translation, which was carried out by a group of leading Russian Sanskritists, was done, strangely enough, by a neurosurgeon B. L. Smirnov, who received J. Nehru's award on the part of the government of India and... a condemnation to exile to Central Asia, to Ashkhabad, on the part of his own government. He saw that 'preventive' rules of the yogic psychic hygiene of the Mahābhārata could bring more benefit, than the mechanistic-materialistic medicine aimed at struggle against developed illnesses.



N. Roerich, Himalayas

Nicolay and Helena Roerichs



After October Revolution, Nicolay Roerich's family, left Russia and, having received American passports, moved to Tibet for a scientific expedition and actually fixed their residence in the Himalayas. Nicolay managed to collect a unique material about culture of peoples of Tibet and Central Asia, to write a set of fascinating ethnographic books. Helena tried to develop a mystical part of the doctrine of E. Blavatsky on the basis of Buddhism and theosophy in her books on the so-called Agni-Yoga.

Roerich insisted on the reality of mystical energies and advised Soviet government to accept the Buddhist mysticism as the basis of the spiritual communism. His advice was ignored by the Soviet authorities and his philosophy was anathematized by the Russian Orthodox Church. Perhaps, the most glorified achievement of the Roerich's family is the ode to beauty of sacred mountains and saints of India created by the brush of Nicolay and Svyatoslav.

Neo-Hinduism

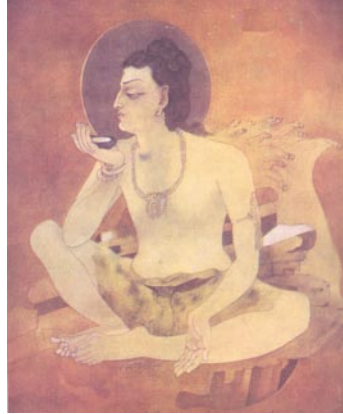
'Entering its modern era with the arrival of the English, India in the last two centuries has witnessed a renaissance of its science and a proper appreciation of the past achievements.'

Subhash Kak

Life is weaved with contradictions – those who aspired to study Hinduism in order to refute it, promoted its revival. The modern period characterized by collision of traditional Indian culture with the West-European oppression have seen revival of ancient traditions and their reconsideration, especially, with emergence in the XIXth century of the reformist-educational organizations such as Brahmo-Samāj ('Society of Brahma') and Āria-Samāj ('Society of Aryans.')

Translations into English and other European languages of sacred and secular Sanskrit poems such as Shakuntala of Kalidasa by W. Jones, decoding of the ancient Indian inscriptions in Brahmi script by Lassen, Masson and James Prinsep, research and translation of Buddhist logical works by Fyodor Shcherbatsky and other scholars, have caused a wave of amplified interest to all aspects of Sanskrit (Vedic) and Prakrit (Buddhist and Jain) knowledge.

On the other hand, Hinduism has shown extraordinary stability, openness and tolerance in its opposition to Islam and Christianity. It even has incorporated religious traditions introduced by conquerors, having found some common ideas, which could promote religious mutual understanding and tolerance. Ram Mohan Roy, Keshob Chondro Sen, Dayananda Sarasvati, Ramakrishna, Vivekananda, Tagores, Nehru, Mahatma Gandhi, Aurobindo Ghosh, S. N. Dasgupta, Sarvepalli Radhakrishnan, D. Chattopadhyaya and other outstanding politicians, educators and philosophers have not only reconsidered conceptual foundations of Hinduism, but also have tried to modernize and integrate it into modern global culture, science and philosophy.



Nandolal Bose, Shiva

Unfortunately, it was found out that integrity of Hinduism was broken, many important traditions were interrupted, and the social structure of the ancient Indian society has lost its resilience that has resulted in strengthening of the fundamentalist and mystic tendencies.

Persons no less than Mahatma Gandhi, Swami Vivekananda and Rabindranath Tagore have called for a change in the teaching of history of Hinduism.

Swami Vivekananda

The doctrine of yoga is excellent. In this area, until now, the humankind stands very far from Hindus. Such true, high and clear understanding of life makes Vivekananda the true leader of humankind.

Leo Tolstoy



Narendranath Datta (1863-1902,) most known as swami ('monk') Vivekananda, a disciple of Ramakrishna (1836-1886,) was one of the defenders and expounders of Vedānta and Yoga in the West. Yoga was presented in his lectures in all its philosophical aspects as an integrated psychophysiology. His speeches at the World Congress of Religions in America and numerous lectures promoted spreading of Yoga and Indian philosophy all over the world. The late Leo Tolstoy, having read his book 'Rāja-yoga,' named him his teacher and the leader of mankind, and Romain Rolland devoted to him two researches, picturing his lectures about karma-, bhakti-, jñāna- and rāja-yogas as 'the universal gospel.'

Concerning European doubtful indology, he wrote the following: 'The History of our country written by Englishmen (and other Westerners) should weaken our mind as it speaks only about our ruin. How can foreigners, who hardly understand a shred of our manners and customs, religion and philosophy, write true and unbiased manuals on the history of India? Naturally, they contain a set of false concepts and wrong conclusions. Indians should write their own Indian history.'

Dayananda Sarasvati



Dayananda Sarasvati (1824-1883,) the founder of the Society of Educated (*Āria-samāj*.) in his book the ‘Light of True Meaning’ (*‘Satyārth-Prakāsh’*) and his translation into Hindi of the *Ṛg-Veda* put forward a courageous idea of unity of all systems of the Vedic philosophy and modernity of Vedic scientific ideas.

He insisted on that the Vedic scientific-philosophical complex has such deep congruity and internal coordination that it should suggest that the Vedas preserved important religious-philosophical and scientific data which have not lost their topicality for present epoch. To tell the truth, his examples testified mainly to a modernization of history and were not enough persuasive. But his vision essentially was true.

Mahatma Gandhi



M. Gandhi styled in India *mahātma* (‘great soul,’ ‘God’) and the father of the nation, has left ostentatious heritage, which was edited in 90 volumes. He developed following the advice of Leo Tolstoy, whom he called his spiritual instructor, methods of nonviolent resistance, which in many respects facilitated the exodus of Englishmen from India. Being the supporter of the idea of kinship of all religions, he at the same time reproached Christian missionaries for distortion of Hinduism.

Mahatma Gandhi said: ‘I find daily proof of the increasing and continuing wrong being done to the millions by our false deindianising of education. These graduates who are my valued associates flounder when they have to give expression to their innermost thoughts. They are strangers in their own homes. What is worse, even the *svarāj* (‘self-governance,’) for which we are struggling, may become foreign in

character, when we finally get it.’ Vinoba Bhave, his follower, and many other contemporary Hindus state that his words were indeed prophetic.

Aurobindo Ghosh

‘The recovery of the perfect truth of the Veda is a practical necessity for the future of the human race.’



Aurobindo

Works of Aurobindo Ghosh, the great thinker of modern India, on philosophy of yoga, spiritual evolution of life have produced original revolution in views at history of humankind and at ancient Indian spiritual heritage. In 1950, soil from all countries of the world had been laid to his memorial and a city of his name Auroville in the form of a galaxy had been founded, home for an international Yogic university.

Aurobindo labeled speculative investigations of the Vedas by contemporaneous Indian authors imaginative, not scientific and insisted, in particular, in his works ‘Secret of the Vedas’ and ‘Vedic Glossary’ on presence in the Vedas of a deep symbolical mystical and psychological meaning.⁴¹ I fully agree with Shri Aurobindo who said in his ‘Secret of the Vedas’: ‘The human mind in its progress marches from knowledge to knowledge, or it renews and enlarges previous knowledge that has been obscured and overlaid, or it seizes on old imperfect clues and is led by them to new discoveries.’

My interest in Indology became much more focused and persistent after reading his ‘Synthesis of Yoga’ yet in 1976-1980. The main ideas of his ‘Secret of the Vedas’ inspired me to undertake my own research and reconstruction of the science in the Vedas. I also appreciate efforts of his followers deciphering the hidden philosophical meaning of scientific (Vedic) terminology in the Mahābhārata,

⁴¹ Sri Aurobindo, The Secret of the Veda, Pondicherry, India: Sri Aurobindo Ashram, 1971.

Brāhmaṇas and Śāstras.

Right, Vedic science was highly spiritual and poetic as it was shown by Aurobindo, but I insist on that it was primarily exact ('iti-ha-asa,' 'it was exactly thus') mathematical-astronomical science of higher category (para-vidyā) much ahead of many theoretical developments in our modern higher mathematics and programming!

I find philological and philosophical methods inadequate, because the ancient Vedic scientific literature was first and foremost mathematical-astronomical. Poetry and mythological symbolism played a subsidiary role. So, analyzing philosophical aspects and not understanding the core content of exact mathematical data, one may easily go astray.

Aurobindo was aware of abundance of apparently meaningless passages in the Vedic literature. Of course, they had not been

meaningless for the scientists of yore. I found that they contained main astronomical meanings, but they were in subtle mathematical encoding and algorithms hard to grasp by contemporary ordinary philological mind. Philological meaning, not only direct but even indirect, which is, seemingly, interesting to most Indian as well as Western scholars, is secondary and in many cases superficial and misleading.

My approach to the Vedas, though formally contradicting Aurobindo's views, does not undermines ethical content of the Vedas. It is scientific, logical, mathematical and astronomical as well as linguistic, symbolic, etymological, religious and ethical.



Nandolal Bose,
Parvati

Modern Heralds of Hinduism

As Australian indologist Greg Bailey remarks, from the end of the 60-th of the XXth century, there was a burst of interest to Eastern religions and mysticism in the world. But on the general background of prevalence of economic education above humanitarian one, interest to India as trading partner, undoubtedly, predominates. Therefore, universities of the West and Australia feel more and more strongly deficit of financing of classical researches and, in particular, Sanskrit Studies. On his belief, it is possible even to speak about the strong anti-intellectual wave overflowing the West. However, it is important to note, continues G. Bailey, that Sanskritists at times limit their researches only to philological and textual aspects, freezing them in artificial space of scholasticism.

While the governments are not inclined to allocate money for narrow philological researches of ancient cultures, private donations on the part of some Hindu donors aspire to support not scientific studying of the Indian religions but religious propaganda and spread of views of sectarian currents.

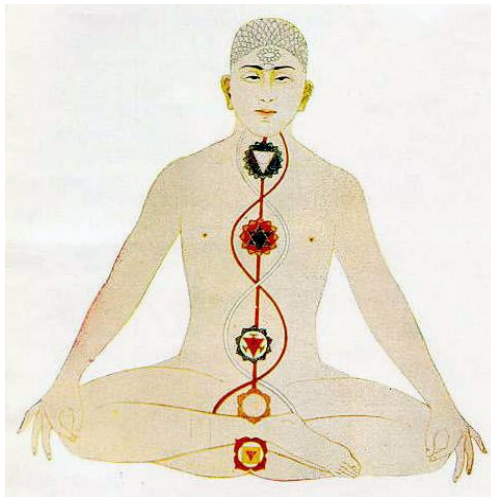
In Russia, the last decades have seen many translations of Bhaktivedanta, Chinmoi, Rajneesh, Mahesh Yogi, Śivananda and others. Works of these authors, undoubtedly, are marked by many merits and variety of techniques of propaganda of yoga and mysticism. However, it is necessary to have in mind that they were written with the purpose of propaganda of Hinduism in the West, focused on the modern Western reader having sympathy to mysticism. Quite often this element receives inappropriate significance, eclipses all other aspects of ancient spiritual culture, giving to its interpretation an unusual bias.

Biological interpretation of the Vedas

V. G. Rele published a book 'Human Mind Power: The Secrets of the Vedic Gods: Vedic Gods as Figures of Biology,' in which he

postulated the extravagant anatomic-physiological symbolism of central nervous system ostensibly described by mutual relations of the Vedic gods. He supposed that the Vedic mythologems encode structures of the central nervous system. It has been further developed by the followers of Mahesh Yogi. Their interpretation of the Vedas, which is offered at the Open University of Maharishi Mahesh Yogi, is an attempt to improve the method of V. G. Rele connecting arithmetic ordinance of the Vedic texts with the structural organization of the human body and brain.

This theory, in fact, lacks originality being a modernized extension of the Tantric Kundalini-yoga symbolism. The latter symbolism is highly imaginative representation of the human psychophysiology through the cosmic symbolism of the Vedic Gods. Primarily, its purpose consisted in preparation of the ancient astronomer's imagination for mathematical-astronomical observation and calculation of planetary cycles as if evolving in the cosmic body of a yogi or yogini who has identified himself or herself with the Solar Universe. Later, it became a mystic method without a concrete astronomical significance.



8. THE VEDIC GLOBAL CHRONOPHILOSOPHY (DARSHANAS)

Despite of obvious successes in the field of studying spiritual heritage of peoples of India in Sanskrit and vernacular languages, the significant part of sources of history of ethics, aesthetics, sociology, psychology, logic, dialectics and other branches of philosophy remains investigated only superficially and demands reevaluation or new perusal.

First, logic and philosophy attracted attention of indologists. Hindu scientific theories and specific doctrines like Tantrism, Brahmanical ethics, psychology and other disciplines had started to be investigated regularly in Europe and America only after the independence of India.



So, deep study of Tantra was undertaken in the beginning of the XXth century by John Woodroff, when dominating Christian ideological biases against any ‘pagan’ beliefs compelled him to accept a pseudonym Arthur Avalon. It did not prevent him to see, however, in Tantrism very advanced doctrine about space, energy and consciousness.

In Soviet indology, which was free from dominance of church ideology, the main interest, nevertheless, had been concentrated on the political and economic history of India treated quite often until the latest time in rigid linear perspective of mechanistic materialism. I remember how Moscow’s indologist K. Z. Ashrafyan showed me a work on economy of India written in the Stalinist period, which began with the words: ‘As comrade Stalin has said, India is a great country.’

Indian ethics, not speaking about yoga, vedānta, mīmāṃsā, tantra, etc., in the atmosphere of dictatorship of materialism suffered social and political ostracism. But even nowadays, the content of ethics, if, in general, it is possible to speak about it in the CIS countries,

which have inherited ideological and methodological principles of the previous period, is reduced, as we noted above, to authoritative etiquette.

However, this feature is inherent also in the West-European thought. A general compulsory military service, totalitarianism, dictatorship, a rigid competition, an arbitrariness of authorities, lawlessness of women, religious intolerance – all this in the countries of Western Europe is expressed more intensely, than in Russia, in the Soviet Union, and now in the CIS. Relapses of earthliness, aching void, the alienation, schizophrenic consciousness are felt everywhere in the world and are fraught with the most dangerous consequences for the survival of the world civilization.

Thus, the reference of political leaders to medieval spirituality without understanding of its ancient roots degenerates everywhere into emasculation of the spiritual traditions, into comical devotion and profanation of science. Overcoming of this spiritual crisis, common for the East and the West, will be impossible without understanding of the deepest and most ancient spiritual tradition expressed in the Vedas and underlying all religions and philosophical systems.

The concept of ‘philosophy’ in Sanskrit is expressed by a number of synonyms: paravidyā (the ‘highest knowledge,’ metaphysics,) brahmavidyā (the ‘knowledge of the great cosmic principle,’) jñāna (‘knowledge,’) anvīkṣikī (‘research,’) darśana (‘view,’) mata (‘theory,’) samaya (doctrine.)

Such terms as anvīkṣikī and darśana, doubtless, are more scientific, than the European term ‘philosophy’ (‘love to wisdom.’)

Anvīkṣikī means reflection concerning data provided by sensual experience or authoritative statement. It is in its essence a logical analysis. Primarily (up to the first century B.C.E.) the term was applied to various currents of thought such as lokāyata, sāṅkhya, yoga. Later it became a synonym of the nyāya school of logic.

Darśana (‘view’) stands for a theory or a general-theoretical account or description of a subject.

Six darśanas based on Upaniṣadas are Mīmāṃsā and Vedānta, Nyāya and Vaiśeṣika, Sāṅkhya and Yoga. These are special philosophical Vedantic disciplines representing subsystems of the Vedic chronophilosophy. Their theoretical categorization took place, most probably, in Proto-Indian period, but classical manuals were written close to the beginning of the Common Era. They develop the tenets of the theory of knowledge, logic, physics, ethics, metaphysics, psychology, and Vedic textual criticism.

Later, in the first millennium C. E., a grammatical darśana was formed. In the Middle Ages, the school of Vedānta was differentiated, generating a set of schools of various orientations.

All of them regardless the main topic start from discussion of proper means of knowledge, of methodology and metaprinciples.

The ideas of the classical Vedic darśanas influenced in the Middle Ages the beliefs of the early Christian philosophers and the Iranian Sufis. From the XIXth century onward they affected German philosopher Arthur Schopenhauer (1788–1860,) U.S. essayist and poet Ralph Waldo Emerson (1803–82,) Russian novelist and moral philosopher L. N. Tolstoy, Alsatian philosopher, missionary, doctor and musician Albert Schweitzer (1875–1965)⁴² and many others.

Mīmāṃsā or the Vedic hermeneutics

The first department of the Vedic philosophy is called Pūrvamīmāṃsā (the ‘first understanding or research.’) It analyses the concept of ‘dharma’ (‘establishment,’ the heavenly law and order) with reference to the Vedic astrocalendar ceremonies and ritual (karma, ‘ceremony,’) whence it has the names ‘karmamīmāṃsā’ and ‘dharma-mīmāṃsā.’

The basic text is ‘Mīmāṃsāsūtra’ of Jaimini with the ‘Bhāṣya’ (‘primary commentary’) by Śābara (III – V cc.) The other important

⁴² Albert Schweitzer, *Die Weltanschauung der indischen Denker. Mystik und Ethik.* München – Bern, 1935.

texts of this school are ‘Ślokovartikā’ of Kumārila Bhaṭṭa and ‘Bṛhati’ of Prabhākara (IV – VIII cc.)

This discipline is traditionally considered the doctrine about ritual, features of the Vedic language and meaning and the use of sayings. However, philosophical aspirations of mīmāṃsā are boundless. It is the first Vedic philosophy explaining the main secret of the Vedic science, methods of knowledge and questions of epistemology, philosophical semantics and textual criticism of the Vedic Saṁhitās and Brāhmaṇas. In addition, questions of the theory of meaning of the Vedic sayings are examined, eternity of sound, instructions concerning the calendar ceremony contained in the first part of the Vedic canon are classified.

Mīmāṃsā investigates and classifies the Vedic instructions concerning the calendar ritual and develops the tenets of epistemology, philosophical semantics and Vedic textual criticism. Problems of the theory of meaning of the Vedic sayings and of the eternity of sound are also included into the field of its interests.

The theory develops into the harmonious theory of knowledge, which most remarkable features are:

- the doctrine about ‘hidden’ (adṛṣṭa) force, which stores all memories of all actions, movements, sounds, ideas and feelings;
- about self-evidence of truth or internal validity and reliability of direct and circumstantial correct knowledge (observing all necessary conditions, such, as health, light exposure, logicity, authoritativeness, etc.);
- about eternity, uncreated character, infallibility and artistic perfection of the Vedas;
- about the Vedic ceremonies as an authentic way of comprehension of the sky’s mechanics;
- about names of the Vedic deities as symbols of planetary movements;
- about ceremonies as reproducing of the heavenly mechanics (due to what priests taste ‘heavenly pleasure’) and – the main thing

- about reality of the world.

Kumarila-bhatta (VII c.)

Kumārila-bhṭṭa is an outstanding philosopher of the Mīmāṃsā school and founder of his own subschool. He is the author of the extensive commentary in three parts on ‘Mīmāṃsāsūtra’ and primary commentary of Śābara. In the first part of his work called ‘Ślokaṁṁrtika,’ Kumārila engages into polemics with Buddhist rational logic of Yogācāra and dialectics of Mādhyamika propounded by Nāgārjuna and his pupil Āryadeva and formulates the Mīmāṃsā theory of knowledge. He adds to the four means of correct knowledge (pramāṇas) of Nyāya nonperception and subaudition. Kumārila approves also the anonymous character of the Vedas (sciences) and their infallibility. The erroneous knowledge is interpreted not as a fallacy, but as a partial knowledge.

Prabhakara (VII – VIII c.)

Prabhākara was a disciple of Kumārila. He commented the ‘Śābarabhāṣya’ and founded the second subschool of Mīmāṃsā. According to Prabhākara, the secondary meaning of the Vedic expressions is of prime importance. The Vedic gods are interpreted as calendar symbols.

Mimansa and programming

This doctrine influenced all Indian philosophies, first of all, the Vedānta, which is named also ‘uttara-mīmāṃsā,’ the ‘second comprehension’ or ‘the supreme (the best, the subsequent and final) philosophy.’ Nevertheless, until the latest time mīmāṃsā was regarded only as the manual on ritual application of the Vedas, and it seemed that except for religious philosophy and reasoning on ritual usage of mantras it could not include anything else. However,

an event happened, which has radically changed the situation. The book ‘The Vedas and computers’ by R. V. S. S. Avadhanulu⁴³ was published, which contains, as the author affirms, a statement of some main principles of this philosophy concerning... modern computing science and programming.

The author examines the FORTRAN computer language in a context of meaning of the expression set with the help of the appointed variable and the instruction on transfer management; in a context of the form of a separate word, a practical interdiction, physical and logic sequence with a due analysis of concepts. Further he reveals subroutines in the Vedas, classifies instructions, analyzes ways of data transmission and such concepts as a step of the task in computers, turn (stack,) paurvaparya (vitati) in mīmāṃsā, system of a mode of division of time, processing of time in computers and a principle avilamba (non-stop) in mīmāṃsā, the password in the light of the mīmāṃsā doctrine about ‘a rule of access’ (adhikara-vidhi) etc.

Professor P. B. Sharma, the vice-chancellor and the founder of the Technological University in Bhopal, the head of Delhi’s engineering college and the dean of the Technological university (Delhi) has characterized this work as a timely contribution offering to include deep wisdom of the Vedic computing science in the future algorithms of high-efficiency calculations, which promises to improve considerably modern computing opportunities. Value of the Vedic computing science, really, consists in an opportunity to improve and speed up logistical algorithm. Therefore, as to applicability and relevance of the Avadhanulu’s work in modern computing science, it is innovative and rather original.

Detection in mīmāṃsā of principles of programming testifies to an interlinking to programming of the Vedas themselves.

⁴³ Avadhanulu R.V.S.S., Shri Veda Bharathi, Vedas and Computers, Hyderabad, 2001.

Vedānta or Cosmic Ethics

If from fullness to abstract fullness, the fullness will remain.

Īṣa-Upaniṣada

Vedānta (lit. the ‘End of the Vedas’) is considered to be the ut-taramīmānsā, the second Mīmānsā or the ‘best, highest investigation.’ Vedānta harmonises the main ideas of the Upaniṣadas, the last concluding part of the Vedic canon, therefore, it is described as the ‘final philosophy.’ This school represents really a coherent philosophical system and a wise and profound cosmic ethics of an astronomer. It scrutinises the problems of the essence of cosmic life, of the final human destination, of the nature of suffering and ‘celestial’ bliss, of Good and Evil, of the due and undue actions. It also discusses the paths of reaching the feeling of serenity and happiness, freedom from ignorance, sufferings and fear of death.

In the light of new interpretation of mīmānsā, the doctrine of vedānta gets also computational dimension. Its major import is self-identification of the scientist-astronomer with Brahman, the soul and the creator of the solar Chronoworld, the ‘spirit’ of the Sun or the full Moon. The astronomer, having expanded his consciousness and artistic imagination, puts himself in the center of the Solar System and comprehends theoretically the laws of movements of all the planets in a context of eternity of rotation of the universe.

The Vedantic aphorism put in the epigraph of this chapter, as V. P. Pathak has noticed, is equal to the mathematical expression: if from infinity to substract infinity, infinity will remain.

An artist, a musician, a poet, a weaver, a potter and an astronomer understanding the course of heavenly bodies and capable to explain such phenomena as eclipses and so forth in ancient Indian consciousness appears as the Creator of the universe.

The Vedānta calling the astronomer to identify himself with the Creator and to develop a ‘space consciousness,’ undoubtedly, was the important part of preparation of the mathematician-astronomer

which it is possible to compare to a ‘formatting’ of the memory of a scientist operating the superbig numbers and concepts of infinity of space and time, preoccupied with infinite continuous observation over stars and differential calculation of speeds of the planets.

Schools of Vedānta

The most ancient Brahmanical currents of Vedānta, such as Advaita-Vedānta (‘non-dualistic Vedic theory’) of Śaṅkara (VIII c.), Bhedābheda (‘differentiated nondifference’) of Bhāskara (IX c.) and Yadava-Prakāśa (X c.) look upon the substance of the world as an impersonal Great Spirit (Brahma.)

The quantity of Vedantic schools had increased considerably during the medieval dissociation of India. Under the effect of Islam, theistic motives had grown and the impersonal Brahman had begun to be worshiped in the form of such deities as Viṣṇu or Śiva, their spouses and their embodiments. Though all Vedantic schools claim the systematisation of Upaniṣadas and correct interpretation of the Brahmasūtra and the Bhagavad-Gītā, they recognise also the authority of some other sacred scriptures. Vaiṣṇavas recur to the Pañcarāgamas, poems of Tamil Ālvārs (‘lost in God’ mystics) and the Bhāgavatapurāṇa. Śaivas respect the poems of the Tamil Nāyanārs (7th–8th centuries C.E.) the North-Indian Nāthas (near about C.E. 1,000) and the Śaivāgamas and the Purāṇas.

The Vaiṣṇava currents are represented by ‘nondualism limited by difference’ (viśiṣṭādvaita) of Yamunācārya (XI c.) and Rāmānuja (1017-1127,) which was reinterpreted later by Jñāneśvar, Rāmānanda, Kabīr and Nānak (founder of Sikhism); ‘dualism’ (dvaita) of Madhva (c. 1197 – c. 1273); ‘natural dual nondualism’ or ‘nondifference in difference’ (svabhāvika dvaitādvaita or bhedābheda) of Nimbarka (XI c.) and Vijñāna-bhikṣu; ‘pure nondualism’ (viśudhādvaita) of Viṣṇusvāmin and Vallabhācārya (1479–1531); Bengal ‘impalpable nondifference in difference’ (acintyābheda) of Caitanya (1485–1533) and Baladeva.

Śaiva currents are represented by ‘Shivait nondualism limited by difference’ (viśiṣṭa śaivādvaita) of Śrīkaṅṭha (XI-XII c.) and schools, close to it, such as Tamil ‘Shivait Doctrine’ (śaivasiddhānta) of Tirumūlar, Meikandar, Arulnandi and Umāpati (asserting the concept of ‘similarity,’ sādṛśya, of the god and souls) and Kannadian ‘Heroic Shivait nondifference in difference’



(Vīraśaiva bhedābheda) or ‘Shaktist nondualism limited by difference’ (śakti-viśiṣṭādvaita) of Śrīpati and Basava (1125–1167); Gujarati ‘dualism of God and Soul’ (paśupati-dvaita) of Nakulīśa; Kashmirian ‘highest nondualism’ (paramādvaita) represented by the doctrines of ‘vibration’ (spanda,) ‘step by step meditation’ (krama,) ‘recognition of the God’ (īśvara-pratyabhijñā,) ‘doctrine based on scriptures’ (āgama,) ‘doctrine of triad’ of categories (trika) developed by Vasugupta (IX c.,) Kallaṭa, Somānanda, Utpaladeva, Abhinavagupta (X c.) and Kṣemendra-Kṣemarāja (XI c.)

The names of schools reflect their attitude towards the solution of the human soul and God relation.

Advaita rejects plurality of souls as erroneous judgement, corollary of ignorance, avidyā. The spiritual subject, uniform, eternal, full of light, life and feeling of bliss, is a true essence of everything.

Viśiṣṭādvaita insists on the substantial unity of the human soul and Brahman, but it emphasises their independent character in manifestation.

Dvaita postulates two separate eternal substances.

Natural bhedābheda recognises three eternal substances: Brahman, cit (‘soul’) and acit (‘inanimate phenomena’: objects, substance of the world and time.) They are different forms, but cit and acit have no independent existence outside of Brahman.

Viśuddhādvaita postulates several levels in Brahman: highest, divine, and indestructible (akṣara,) which is the basis of the existence of souls, the world, time, action and natural character (svabhāva.) The

highest substance penetrates everything and is its support.

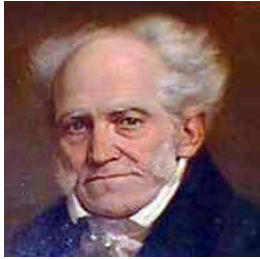
Paramādvaita, designated sometimes as ‘realistic idealism,’ justifies the idea of a synthesis of dvaita, viśiṣṭādvaita and advaita. The world is the product not of a human, but of the universal spirit, therefore, it is real. The human soul in essence is the same, as the universal spirit, however, by virtue of three restrictions does not know it. The elimination of this ignorance is possible by the way of yoga or self-identification with the highest spirit.

Brahma-Sutra

Brahmasūtra, the basic text of Vedānta (also called Vedāntasūtra, Śārīrakasūtra, Uttaramīmāṃsā,) was composed by a symbolical author Bādarāyaṇa generally identified with Vyāsa. It contains 555 enigmatic notes, which give a schematic exposition of major philosophical propositions of the Upaniṣadas and the Āraṇyakas. Without the explanations, the meaning of these short formulas is not clear and gives large freedom to interpretation.

The first chapter is named ‘Colligation’ (Samanvaya) and is a selection of expressions from the Upaniṣadas about Brahman. The second chapter called ‘Noncontradiction’ (Avirodha) refutes objections based on the authority of the Smṛti texts, but contradicting Śruti. The third chapter, ‘Realisation’ (Sādhana) explains the essence and the knowledge of Brahman (brahma-vidyā) and the method of its realisation. It discusses also the law of action (karma,) states of consciousness, the nature of vital energy (prāṇa,) the concentration of consciousness, the significance of the four stages of life, and the nature of liberation of consciousness from ignorance. The fourth chapter entitled the ‘Fruit’ (Phāla) describes the procedure and technique of meditation, the use, in particular, of a cyclical calendrical-astronomical symbolism. The other themes are the result of this realisation, the liberation from the fetters of actions (karma,) the stages of attainment of understanding of the personal identity with dynamically rotating universe, discovering the true essence of the soul and, occasionally,

acquiring supernatural abilities.



Upanishadas

‘Studying the Upaniṣadas was joy of my life and will be a consolation to me in death. Each phrase of the Upaniṣadas breathes a spirit of noble sincerity. In the whole world, there is no scientific work so noble and elevating as the Upaniṣadas. They are fruits of the supreme wisdom. Eventually, they can become belief of our people.’

A. Schopenhauer

The Upaniṣadas (the secret ‘Sessions’) or Vedānta (‘End of the Vedas’) contain abundant allusions to the Vedic or Brahmanical philosophy. Upaniṣadas being the last part of the Vedic literature represent the first poetical synthesis of the Vedic philosophy. They discuss issues of the theory of knowledge, logics, ontology, physics and metaphysics, psychophysiology, astronomy, mathematics, textual criticism, ethics and aesthetics (nature of art perception, aesthetic experiences and empathy.)

About two hundred texts have come down to us. One hundred eight are considered as most authoritative.

The texts discuss the themes connected with the chronoritual, chronomythology and chronocosmogony. The teaching reflects the process of achieving by Vedic astronomer the identity with the sky through the expansion of chronoconscience and astronomical-mythological imagination.

The main doctrine concerns the identity of ātman and paramātmān (Brahman,) or the soul and the cosmos. Ātman means ‘nature’ (cp. Greek ‘physics’) or an embodied soul, a human being. This important concept frequently is reduced to the notion of an ‘inner essence’ or ‘soul.’ However, a human being is a ‘living body’ endowed with spirit (in ancient India, it was emphasised by Lokāyatikas, in Europe by the Dutch philosopher Benedict de Spinoza, 1632–77, and some Christian theologians.) Characteristically, Vedānta refers to a

person as śarīra (lit. ‘body’) or śārīraka (‘embodied’ being) and labels soul as ‘thin body’ (sūkṣmaśarīra.) In this connection, paramātman is to be understood as ‘supernatural’ (absolutely natural) essence (cp. Greek ‘metaphysics.’) Brahman means a ‘great’ and ‘growing, self-developing’ cosmic substance, generating all living and nonliving objects during the temporally conditioned process of self-growth or self-development.

The soul is referred to as vital energy (prāṇa, the principle of life and movement.) It is identical with all-penetrating substance (puruṣa.)



The ‘Śvetāśvataropaniṣad’ mentions a cosmogonic theory, according to which the world had appeared by virtue of its own nature (svabhāva.) Here, we can see the origin of the ‘natural law’ concept.

The Upaniṣadas do not expound a philosophical doctrine, rather they reflect the main ideas of the doctrines formulated in the Proto-Indian Vedic period and codified later as six darśanas.

Their content is not limited to ritual, mythological and cosmogonic themes. Ceremonies were used as metaphors or universals of human life and calendar phenomena.

Main ideas of the Upaniṣadas found reflection in the ancient Greek philosophy, early Christian and, especially, Orthodox theosophy, Taoism, in teachings of Iranian Sufis, since the XIXth century in the European and American philosophy (A. Schopenhauer, R. W. Emerson, L. Tolstoy, A. Schweitzer, A. Einstein, E. Shrodinger, K. E. Tsiolkovsky, V. I. Vernadsky and many others.)

Among śāstras based on Upaniṣadas, the major are six darśanas (mīmāṃsā and vedānta, nyāya and vaiśeṣika, sāṅkhya and yoga) representing special philosophical disciplines of Vedānta.

Yoga-Vasishtha

It is a grand Vedantic philosophical epic poem, consisting of twenty-four thousand stanzas. Being one of the additions to the Rāmāyaṇa, it contains a description of the period of the Rāma's studies in the hermitage of the sage Viśvamisra and a detailed exposition of Vedānta.

Agamas and Tantras

Tantras are palm or birch bark books which pages were pulled together with strings passed in lateral and median apertures (tantu.) These were sacred 'sheaves of textbooks' (like encyclopaedias) of Śaivas, Vaiṣṇavas, Śāktas, Jains and Buddhists. They had been codified in the first millennium. But their teachings are very ancient. Tāntrikas claim that their books are the most ancient in the world. The total number of Tantras is around two hundred.

As a rule, each Tantra has four parts: 'behaviour' (caryā) or public festivals, home 'ritual' (kriyā,) 'knowledge' (jñāna) and 'self-control' (yoga.)

Śaiva Tantras include sixty-four Bhairavāgamas of nondualistic orientation, eighteen Rudrāgamas, expounding dvaitādvaita, and ten Śaivāgamas clarifying dvaita. Kashmirian monistic Śaivism relies heavily on the Āgamas of the first category. Tamil Śaiva-Siddhānta prefers two other categories of Tantras, emphasising the special significance of the Kāmikāgama. The Rudrāgamas, preaching dvaitādvaita, are of equal importance for the Kashmirian and Tamil Śaivism. The doctrines of Pāśupatas, Kapālikas, Kālamukhas and Śaivas were developed in the stream of dualistic Tantras.

Shaktism follows advaita, but prefers to designate the highest reality with the name Śakti, the mother-goddess, who personifies the night sky endowed of dynamism, energy and bliss. Her spouse Śiva personifies serenity and peacefulness and embodies her passive, static state. Śāktāgamas consist of five Subhajāgamas, sixty-four

Kāntāgamas and eight Miśrāgamas.



Basava

Abhinavagupta (X – XI c.)

This is one of the most outstanding Śaiva philosophers of the Medieval Ages. He was an eminent poet, musician and literary critic. His phenomenal creation is *Tantrāloka* (the ‘Light of Tantras,’) voluminous encyclopaedia of Tantrism. He also wrote a number of works on philosophy of Kashmirian Śaivism, theatre, aesthetics and poetics. The legend states that he had over one thousand of disciples. All of them followed their teacher at the end of his life and hid themselves together in a Himalayan cave, but for Kṣemendra, who is considered as his best student.

Kshemendra-Kshemaraja

He had processed the huge bulk of Vedic and Puranic mythology and created several adaptations of *Itihāsas*, of many other Śāstras and commented all major works of Kashmirian Śaivism.⁴⁴

⁴⁴ Kṣemendra... Opp.Cit. Pp. 17–18.

Nyaya

The term means ‘inference,’ analysis, law, syllogistic, logical reasoning and logic. Historically, nyāya is represented by two schools: Vedic nyāya and medieval navyanyāya (‘new logic.’)

Nyāya is interested first of all in epistemology and logic. It recognises four methods of right knowledge (pramāṇa): perception, inference, comparison and verbal authoritative revelation. The primary purpose of nyāya is removal of false knowledge, which is understood as the taking of one object for the other.

Nyāyasūtra

The sourcebook of the ancient school is Nyāyasūtra of a symbolical author Akṣapāda Gautama (II century B.C.E. – II AD.) Its major commentaries are composed by Pakṣilasvāmin Vātsyāyana (400 B.C.E.) and Uddyotakara (VI AD.) Together with the consequent commentaries, the total volume reaches several thousands of pages.



The text consists of five hundred twenty-eight sūtras, divided into five large sections of two parts each split further into thematic chapters. First the text lists the terms, gives their definition, and then presents a critical analysis. Main terms, composing a conceptual nucleus of nyāya, are the following: instruments of knowledge; object of knowledge; doubt; purpose; obvious facts; the basic tenet; the constituent parts of the argumentation; indirect argument; dispute for elucidation of the truth; debate for the sake of victory; objection without counterargument; erroneous logic premises; verbal subterfuges; incorrect objections based on likeness; conditions of defeat in a debate.

Navyanyāya

New nyāya or logic had been founded in XIII C.E. by the great logician Gaṅgeṣa, the author of the ‘Tattva-Cintāmaṇi’ (the ‘Wish-stone of Categories.’) It is represented by a succession of notable philosophers: Pakṣadhara (XV c.), Raghunātha Śīromaṇi (XV – XVI c.), Mathuranātha (XVII c.) These philosophers produced a huge number of works on logic, semantic problems, epistemology, physics and grammar.

The basis of its ontology is realism. This logic does not examine the expressions, but operates with ‘meanings.’ In some respects, it definitely excels the Aristotelian logic; the concepts of ‘conjunction,’ ‘disjunction’ and their ‘negation,’ as well as application of the De Morgan law are familiar to it. Its concept of number has anticipated mathematical logic by some centuries.⁴⁵

The new nyāya does not use symbols, manipulating with Sanskrit grammar rules and producing an inconceivable set of logical expressions. That reflects a general tendency of Sanskrit learning to use sparingly the language means and to maximally saturate the sense.

Vaiśeṣika

Vaiśeṣika (‘analysis of properties’) is closely connected to Nyāya. Vaiśeṣikasūtra has smaller significance compared with an independent work of Praśastapāda (IV – V c.) ‘Summary of Characteristics of the Categories’ (‘Padārtha-Dharma-Saṃgraha.’)

The primary objective of the Vaiśeṣika is formulation of a realistic ontology, which, in particular, includes a detailed atomic theory of matter. Being is analysed in terms of substance, its qualities, movement, common and particular characteristics, and internal inexistence.

⁴⁵ Daniel Henry H. Ingalls, Materials for the Study of Navya-Nyaya Logic, Cambridge (Mass.) – London, 1951 (Russian tr. M., 1973.)

The means of true knowledge are perception, inference (based on the solid theory of syllogism and analysis of the marks of valid judgement,) memory and intuition.

The incorrect knowledge is interpreted as doubt, error, bewilderment and dream.

Vaiśeṣika-Sūtra

The sourcebook of Vaiśeṣika philosophy is assigned to a sage Kaṇāda. It was created, apparently, in the first centuries C. E. There is only one direct commentary. The text is divided into ten sections, in which the following topics are examined minutely: partitioning of everything existing, the concepts of general and special characteristics; the theory of substances, including all aggregate states of matter; space and time; spiritual substances; the description of the body with its 'instruments of knowledge and action' (buddhīndriya and karmendriya); movement and action; virtue, duty, responsibility; physical and cognitive qualities; certain and uncertain perception; a classification of the acts of knowledge.

Sāṃkhya

Sāṃkhya ('enumeration,' synthesis) stands for metaphysics, listing and classifying basic elements of the psychophysiological continuum and representing the theoretical base of the yoga psychology, Vaiṣṇava and Śaiva Tantras, Śāstras and Siddhāntas.

The ontology of Sāṃkhya is founded on the theory of preexistence of the consequence in the cause (satkāryavāda.) Prakṛti ('precreation,' 'nature,' ability to be modified, and the first cause of the world of objects) represents dynamically and continuously self-developing world substance, creating the world from itself. The tension of three multicoloured 'cords' or 'strings' (guṇas,) maintaining and governing the world, is being altered, conditioned by the natural law, similarly to the revolution of the day, night and dawn.

The elements of the macrocosm are considered to be objectified principles of the microcosm: five aggregate states of matter (mahā-bhūtas) and their five subtle emanations (tanmātrās) strictly correspond to five instruments of perception and five instruments of action (indriyas.)

The epistemology of Sāṃkhya accepts three sources of correct knowledge: perception, inference and (authoritative) word. Comparison, supposition and absence are dependent on them.

Sankhyakarika

‘Sāṃkhya in verses,’ the major text of classical Sāṃkhya (IIIrd c. C. E.,) assigned to Īśvarakṛṣṇa, consists of 73 verses and is considered an abstract of a not extant larger text ‘Śaṣṭitantra.’ The authors of the major commentaries are Gaudapāda (VI c.,) Vācaspati (IX c.,) Vijñānabhikṣu (XVI-XVII c.) and Aniruddha. A number of works of the ancient authors Pañcaśikha, Varṣagaṇya is known from medical treatises and Mahābhārata. The work of Varṣagaṇya (XVI c.) pulls Sāṃkhya together with Vedānta.



Kapila

Kapila, the founder of this system, is a mythological personage (embodiment of lunar deities Viṣṇu and Agni.) However, the text Sāṃkhya-Pravacana-Sūtra assigned to him belongs to the XIVth c. C. E.

Yoga

Yoga (‘union’) is a psychological discipline, which purpose is integration of spiritual, mental and physical energies and control over all five levels of consciousness (states of correct and false cognition, dream, imagination and memory.) True kriyā- or rāja-yoga

represents ascetic ethics, hygiene, physiotherapy, physical culture, gymnastics, psychology and parapsychology. Yoga is closely connected to Ayurvedic medicine, jyotiṣa astronomy and military training of Dhanurveda.

In the ‘Yogasūtra’ of Pātāñjali Yoga is depicted as a science of psychology and eight-stepped method of cessation of functioning of all levels of consciousness and reaching the maximum psychophysical integration.

The ethics of Yoga, obviously, was designed for the ascetics stepping into the last stage of life being about to renounce the world. It straightforwardly demands total renunciation, abandonment of public life and transgressing the principles of ordinary behaviour, overcoming fear of death, absolute nonviolence (as in Jainism and Buddhism,) absolute truthfulness, nonstealing, nonacquisitiveness, chastity, satisfaction, cleanness, negation of flesh, reverence of tutelary goddess or god, and continuous recitation of the Vedas or their parts.

These principles form the basis of the three Yogas (jñāna, karma and bhakti,) formulated in the Bhagavad-Gītā.

The demand of strict hygiene, control over all subconscious functions of the body, breathing, heart beats, muscles and internal organs form a department called haṭhayoga (the ‘method of force.’)

The last stages of Yoga constitute rāja-yoga (‘imperial method.’) Its aim is the withdrawal of attention from external objects, and concentration of mind, imagination and all other conscious faculties on themselves. This method ensures to a yogi union with reality and the death at will.

Yogasutra of Patanjali

The basic text Yogasūtra (c. II c. B.C.E. – III c. C. E.) is attributed to the author of the ‘Large commentary’ to the grammar of Pāṇini. The text consists of one hundred ninety-five sūtras divided into four chapters: chapter about concentration (samādhi-pāda); chapter about

practice (sādhana-pāda); chapter about supernatural powers (vibhūti-pāda) and chapter about final emancipation (kaivalya-pāda.)

The major commentaries are 'Yoga-Bhāṣya' of Vyāsa (Vth c.C.E.) and Rājamartāṇḍa of Bhojarāja.

Nastika



Alongside with the six āstika or Vedic darśanas, there existed three nāstika schools, not accepting the authority of the Vedas: Lokāyata (developed by one of the Kāpālīka sects and, probably, specialised in the art of dispute,) Buddhism and Jainism.

Gigantic literary complexes of Buddhism (in a Prakrit language Pāli and Sanskrit,) Jainism (in Apabhraṃśa language and Sanskrit,) Śaiva, Vaiṣṇava and Śākta Tantrism were formed during the same Brahmanical period.

In the Lunar mythological model of culture and philosophy, these nonvedic schools were related to the new moon period, to the 'death' of the Moon, domination of gloom and darkness, prevalence of Mlecchas ('dark') twilight forces, supporters of darkness, opponents of Āryas ('enlightened, bright' lunar phases.) These currents of thought contrary to the Vedic philosophy of light and all-encompassing harmony are marked by adherence to mysticism and asceticism, sometimes mixed with extreme pessimism.⁴⁶ For example, Kāpālīkas covered their bodies with ashes, indulged in drinking vine from a skull and denied all moral conventions, values and standards of behaviour. Buddhism condemned the desire to live and to love as the

⁴⁶ Ingals, D. H. H. Materials... Opp. Cit.

most important cause of sufferings. Buddha demonstrated in ‘Jātakas’ determination to renounce the world and the life itself. Jainas have as a highest ideal the voluntary suicide under a pretext of not willing to harm the other living creatures.

However, all these extreme views do not contradict the main Vedic ethical approach. They adhere to the same stream of ethics, follow the same lunar calendar and adopt the same epistemology, logic and dialectics, which are adjusted for their purposes, modified or improved.

In the work of Jain writer Haribhadra Sūri ‘Synopsis of Six Worldviews’ (‘Ṣaḍ-Darśana-Samuccaya’)⁴⁷, Lokāyatikas are determined as Yogins-Kāpālikas or Tāntrikas worshipping Śiva-Bhairava (the ‘Horrrifying God’ of the New Moon) and Kālī (the ‘Black’ Goddess of the New Moon night) as destroyers of the (lunar) universe. Their jokes on Vedic deities and insults of Vedic priests are not destructive, as those scholars, who consider them materialists, sometimes affirm. More often they are depicted as the most experienced polemicists, tending, probably, to unshroud the prejudices and superstitions brought about by a literal interpretation of Vedic metaphors.

Lokāyatikas are mentioned by Sanskrit poet Bāṇa (VII c.) in his poem ‘The Life of Harsha’ (‘Harṣa-Carita’) among the pupils and teachers of different creeds at school of Divakaramitra. Frequently it is emphasised that amid the four sides of life, they paid attention only to love (kāma.) Occasionally, the Kāmasūtra of Vātsyāyana gives the interesting description of their views. It allows connecting them with the followers of Kāmaśāstra.

Buddha is also intrinsically interconnected with the Brāhmaṇical tradition. He is described in Purāṇas as an embodiment of Viṣṇu.

Mahāvīra, the mythical founder of Jainism, and his predecessors have likewise names of embodiments of Viṣṇu.

The calendrical cyclical pattern for harmonisation of the vari-

⁴⁷ Haribhadra Sūri: Ṣaḍ-darśana-samuccaya (Review of the six viewpoints). Vārāṇasī, 1944.

ous philosophical views was created in the early antiquity, and later efforts of philosophers were centred in developing particular doctrines without attempting to destroy the whole system. Therefore, the religious-philosophical doctrines of Hinduism trace their respective origins to the ancient sources harmonised in a framework of astronomical-mythological poetics.

Up to the VIIIth c. C.E. (in Kashmir up to the XIVth c. and in the Southern India even later,) during more than one thousand years Buddhist and Jaina philosophies peacefully competed against Brahmanical schools. Advaita-Vedānta of Śaṅkara is sometimes regarded as an outcome of this polemic. It absorbed many philosophical Buddhist ideas of the mādhyamika school of Nāgārjuna. Philosophical systems of different hue were developed in the open atmosphere of public disputes, where everything could be discussed, including extreme points of view.

During the rule of Guptas (IV – VI c. C.E.,) Hinduism became a high-powered religious current, which had extremely broad cultural and ethnic basis.

After expulsion of Buddhism from India and Central Asia into Tibet and Eastern Asian countries by Huns, Pratihāras, Gurjaras and Muslim invaders, the polemic between Brahmanism and Buddhism was replaced by the disputes between Brahmanical schools themselves and different sects inside of these schools. This process led to the further differentiation of classical darśanas.

Besides, Islam, which appeared in Northern India in XI c.C.E., provoked the emergence of theistic schools. Previously, theism was only slightly marked in Nyāya. Destruction of Buddhist universities with their large infrastructure and liquidation of the encyclopaedic Sanskrit education had caused a serious decline of Indian philosophy in the XVIth – XVIIIth centuries.

9. RITUALISTIC (YAJNIKA) INTERPRETATION

The yajnikas or ritualists see practical value of the Vedic songs in their use in religious ritual. Some outstanding Indologists such as R. Rot and G. H. Wilson followed what they believed the religious-ritualistic theory of Sāyaṇa. J. Gonda, P. Thieme in accord with the mīmāṃsā viewpoint treated the Vedic Gods as deifications of abstract notions or ‘powers.’

Evidently, this way of interpretation of the Vedic texts with the help of ritual is not much promoting and reliable, because the very function of the Vedic ritual and, especially, of the Vedic altars cannot be reconstructed without the reference to the ancient undeciphered texts, and, on the other hand, there is no opportunity without the texts to check up, as far as modern relicts of ritual are concerned, their correspondence to the Vedic standards. Such way is fraught with modernization of history or its mystification.

Protestant assault upon Hinduism

‘When walls of a powerful fortress of Brahmanism are surrounded, undermined and, at last, are taken by storm by crusaders, the victory of Christianity will be full and final.’

M. Monier-Williams

Montgomery has declared, ‘Christianity had nothing to teach Hinduism, and no missionary ever made a really good Christian convert in India. It was more anxious to save the 30,000 of his countrymen in India than to save the souls of all the Hindu by making them Christians at so dreadful a price.’

However, such sober voices quickly were suppressed by a row kicked up by angry Protestants, who began to pronounce verdicts similar to that formulated by Sir Henry Norman in his book on the Far East: ‘Asia – always excepting Japan – has never been civilized

and never will be unless a great change comes, which this age is not likely to see otherwise than at the mouth of the cannon and the point of the bayonet.’

According to Christian missionaries, Vedic religion was work of human folly and diabolic inspiration, a manifest work of Satan. Vedic gods were manifestations of devils. Reverend A. H. Bowman wrote that Vedanta was ‘the last and the most subtle and powerful foe of Christianity.’ You should know that he meant only Western Christianity, a clear degradation of initial Byzantine teaching preserved somehow only in Russian orthodox theology and the teaching of the Fathers. Paradoxically, the initial teaching of Christianity was namely Vedanta.

Nothing strange that in 1870, at the First Vatican Council, Hindu pantheistic beliefs were anathematized. The majority of Englishmen of the 18-19th centuries justified their superiority by the concept of ‘philanthropic Protestantism.’ ‘It is not only our duty,’ declared Lord Palmerston, the then Prime Minister, ‘but in our own interest to promote the diffusion of Christianity as far as possible throughout the length and breadth of India.’

Richard Temple, another high officer, addressed a mission in New York in the most explicit terms, ‘Thus India is like a mighty bastion which is being battered by heavy artillery. We have given blow after blow, and thud after thud, and the effect is not at first very remarkable; but at last with its crash the mighty structure will come toppling down, and it is our hope that someday the heathen religions of India will in like manner succumb.’

He said in a 1883 speech to a London missionary society intended to generate donations to missions, ‘India presents the greatest of all fields of missionary exertion... But what is most important to you, friends of missions, is that there is a large population of aborigines, a people who are outside caste.... If they are attached, as they rapidly may be, to Christianity, they will form a nucleus round which British power and influence may gather.’

German Marxists in Russia also resorted to the same tactics of recruiting proletariat in order to overthrow the Russian bourgeois government in 1917. The pro-American bourgeois government of B. Eltsin 70 years later also resorted to every kind of trick and 'democratic' camouflage in order to recruit the outcast elements for dismantling the Soviet Union.

Protestant indology was a kind of rude colonialist assault upon the Vedic mythology. All the pagan gods were indiscriminately rejected as products of barbarous imagination or superstition. British politician William Wilberforce (1759-1833) expressed this principle in a clear words in his speech to the House of Commons on behalf of the missionaries toiling in India, 'We might have anticipated the moral condition of the Hindus by ascertaining the character of their deities.' 'In the adventures of the countless rabble of Hindu deities, you may find every possible variety of every practicable crime. ...Every vice has its patron... their divinities are absolute monsters of lust, injustice, wickedness and cruelty. In short, their religious system is one grand abomination.'

He maintained, quoting the Directors of the East India Company, that these traits of character flowed directly from 'the nature of their superstitions and the degraded character of their deities, as well as the almost entire want of moral instructions.'

The British calculated that to subjugate India, they must undermine the soul of the people, its faith in the Vedic gods and goddesses, the temples and idols, the texts and the language, in which those texts and everything sacred in that tradition was enshrined.

'Researches' of the first British Sanskritists in India during the period from 1700 till 1800 resembled more slanderous fabrications, in which the idea about barbarous, primitive and young character of the Vedic literature and culture and the superiority of the 'Christian' culture of colonizers was proved.

During two centuries official Western indology purposefully criticized and derided all branches of the Indian philosophy depicting

Vedic literature as poetry or mythology. One tub-thumper declared that the damnation of India is Hinduism. To his mind, more than two hundred millions confessed a monkey mash of mythology, which suffocated the nation.

The Evangelists frightened by the idea that Christians could take a great interest in ‘idolatry’ and ‘paganism,’ in fact, in true science and art of the ‘ancient world,’ and, seeing in India an unlimited field of missionary activity, insisted on that their ‘Christian’ government has undertaken a duty of spreading Christianity. But even without the governmental sanction, Evangelists arrived to India in crowds and tried to ‘baptize’ each and everyone, as it was done before them by Muslim fanatics in order to destroy ‘superstitions of the infidels.’

In such atmosphere, the first professional Sanskritists – W. Carey, William Jones, Charles Wilkins and Thomas Colebrooke, which can be called the fathers of English indology, – were formed.

William Carey



William
Carey with his
Indian teacher
Mrityunjay

The history of Western missionary Orientalism in India starts from William Carey, the founder of the Missionary Baptist Society, who wrote a set of grammars and dictionaries of Marathi, Sanskrit, Punjabi, Telugu, Bengali, and issued in Serampore more than 200000 copies of the Bible and its parts almost in 40 various Indian languages and dialects. His first publication was the book ‘Consideration of a Duty of Christians to Use Means for the Conversion of Pagans’ (1792 .)

He wanted to train a group of ‘Christian’ men of science, which would investigate the Vedas, ‘these mysterious sacred nonsenses,’ and would expose them as worth for nothing trifles. He was strongly annoyed with that this ‘graceful gold casket of Sanskrit’ ‘has been filled only with a pebble and rubbish.’

H. H. Wilson (1786-1860)

H. H. Wilson, the greatest Sanskritist of his time, became the first Boden professor of Sanskrit in Oxford in 1832. This faculty had been founded on funds of colonel Joseph Boden, who came from India in 1807 and bequeathed his funds with the purpose of preparation of missionaries, which would translate the Bible into Sanskrit and would 'educate' peoples of India.

As to his political convictions, Wilson was convinced that the Protestant culture should replace the Vedic culture and that the good knowledge of the Indian tradition would help to carry out this transformation. He hoped that diligent efforts would help to overthrow 'ostentatious,' erroneous and false Vedic system with the 'spear of Christian truth.' He also was ready to give a prize in two hundred pounds... 'for the best refutation of Hindu religious system.'

Friedrich Max Muller



'If I were asked under what sky the human mind has most fully developed some of its choicest gifts, has most deeply pondered on the greatest problems of life, and has found solutions, I should point out to India.'

Friedrich Max Muller

Max Müller (1823 – 1900,) the native of Dessau (Prussia,) was one of the most known indologists of the XIXth century. He was pupil of the German philosopher F. W. Schelling (1775–1854) and Franz Bopp, the author of the 'Analytical Comparison of Sanskrit, Greek, Latin and Teutonic languages' (1820,) in which the relationship of the Indo-European languages was proved. His works include the 50-volume series 'Sacred books of the East,' six-volume edition of the R̥g-Veda with comments of Sāyaṇa, translations of the Vedic hymns and the Upaniṣadas, as also works on mythology, religious studies, linguistics and folklore.

M. Müller dared to praise quite often the Indian culture, but, lecturing in Christian mission in Westminster Abbey in 1873, he made

a declaration that ‘Hinduism has died or dies, because it belonged to an ideological layer, which for a long time has been buried under a foot of the modern man.’ He also asserted that ‘worship of Śiva, Viṣṇu and other popular deities was in many cases more spoiled and wild than worship of Jove, Apollo or Minerva. <...> The orthodox Brahmanism has stopped to live more than thousand years ago.’

His approach to the Vedas was extremely narrow and formal. Müller was excited only with rather simple morals of the ‘New Testament’ and the ‘Koran.’ More complicated scriptures such as the ‘Ancient Testament,’ the Southern Buddhist ‘Tripitaka,’ the ‘Dao-De-Tsin’ of Lao-tze, and the ‘Kings’ of Confucius were placed, in his opinion, thereafter. Naturally, the Vedas and the Avesta were in the rearward.’

He considered the Vedic literature in the row of ‘fables, traditions and songs of wild peoples’ and treated the Vedas as an ‘earlier sample of an initial stage and, besides, more intellectual than in wild spells of Gottedots and Bushmen.’⁴⁸

And in 1876, Müller wrote to his friend: ‘India is much more ready to accept Christianity than Rome or Greece were during saint Paul.’⁴⁹

Max Müller openly said that his edition and translation of the Vedas will ‘considerably affect in future <...> the destiny of India and formation of consciousness of millions souls in this country. It is a root of their religion, and, having shown them, what the root is, I am sure, it is possible to eradicate everything, that has arisen from it within the last 3000 years.’⁵⁰

⁴⁸ George Benjamin Walker, *The Hindu world, an encyclopedic survey of Hinduism*, New York, 1968. 2 Vols.

⁴⁹ Satsvarupa Dasa, *Vedic Literature: The Tradition Speaks for Itself*, Delhi, 1985. P. 178.

⁵⁰ *The Life and Letters...*, Op. Cit., Vol. I, p. 328; N. S. Rajaram & David Frawley, *Vedic Aryans and the Origins of Civilization*, New Delhi, 1997. P. 10.

He sharply criticized views of the German scientist Spiegel who asserted that the biblical theory of creation of the world was borrowed from ancient religion of Persians or Iranians.

In 1926, the French scientist Louis Jacollio, the main judge in Chandranagar, wrote a book entitled 'The Bible in India.' In this book, he acknowledged that all main philosophies of the Western world originated in India, which he glorified thus: 'The Earth of ancient India! A cradle of mankind, greetings to you! Greetings to you, the respectable Native Land, which has not been buried till present under a dust of oblivion regardless centuries of brutal intrusions. Greetings to you, the Native Land of belief, love, poetry and science! We welcome revival of your past in our Western future.' Müller floutingly commented that 'the author was, evidently, initiated into Indian brahmanhood.'

Pseudo-Christian arrogance combined with non-sufficient knowledge of Sanskrit pushed first European scholars to infringe on Indian nation's sovereignty and pride. Arthur Schopenhauer ironically observed: 'I have some suspicion that our Sanskrit scholars understand the texts not better than our schoolchildren their Greek or Latin.' Swami Dayananda Sarasvati compared M. Müller 'to a kid learning to go.' He wrote: 'Professor Max Müller was only capable to outline something with the help of widespread periphrases from the Vedas.'⁵¹

No wonder that Max Müller was among the most ardent champions of the racial 'Aryan idea' and his interpretation of the Vedas is misleading.

M. Monier-Williams (1819-1899)

M. Monier-Williams, the author of the well-known 'Sanskrit-English Dictionary,' became the successor of H. H. Wilson, his

⁵¹ Svami Dayanand Sarasvati, Satyārtha Prakash, Third Edition, Dilli, 2000. P. 278. (In Hindi).

teacher, in Oxford and founded there the Indian Institute. He wrote some works about Hindu and Buddhist wisdom and religion. In the 'Foreword' to his posthumously issued dictionary, he admitted that he made it with one purpose – to facilitate the translation of the Bible into Sanskrit.

Further, he explained: 'For what purpose then this huge territory has been handed to England? Certainly, not to be contemptible object of political, social or military experiments, not for benefit of our trade or increase in our riches – but for that each adult person and child from cape Comorin up to mountains of the Himalayas could be elevated, educated and converted to Christianity.'

It is possible to see indirect condemnation of the English policy in India and a utopian view of Christian humanism. Monier-Williams, undoubtedly, had big sympathy to Indian scholars, without whose help his dictionary would not see the light in that monumental form, which it acquired in the course of half-century self-denying work. In order to refute reproaches that, being a Boden professor of Sanskrit, he did not translate anything important from this language, he declared that, those who mocks at him and imagine themselves great experts, when contacting Indian scholars should pass the most severe exam.

At the same time, all these confessions show that even the most ingenious scholars in Europe were captives of superstitious views and did not aim at all to try to comprehend that great culture, which they studied.

Maurice Winternitz (1863-1937)



Professor of indology M. Winternitz is known as the author of a multivolume history of the Indian literature. It is sad to realize that heart of the person who was acquainted with masterpieces of this greatest philosophic-aesthetic tradition in originals, remained hard and non-sensitive to its objective merits. This attitude is visible from his condemnation of A. Schopenhauer's ad-

miration of the Upaniṣadas.

Winternitz's judgments about the Vedas are superficial and lack originality: 'Authors of these hymns rise extremely seldom to elevated heights and deep passion, say, of the religious poetry of Jews.'

He is responsible for that the far-fetched relative dating of the Vedic texts put forward in a hurry and supported by philologists like M. Müller were fixed in science.

D. N. Ovsyaniko-Kulikovsky

D. N. Ovsyaniko-Kulikovsky, who lived in the XIXth c. in the orthodox Russia, wrote a book entitled 'The Foundations of the Vedaism.' He characterized the Vedic Aryans as an optimistic tribe full of life and free from excesses of mysticism, asceticism and pessimism. Their religion was naive ritualistic polytheism similar to the Greek one. Mantras or prayers represented vital parts of the ritual. The god Agni was a symbol of deified fire or Sun. Soma was of indefinite character – Moon, Sun, liquor...

T. Y. Elizarenkova

T. Y. Elizarenkova in her Russian translation of the Ṛg-Veda is inclined to conceive the Vedic Gods not infrequently as fetishes and deified tribal leaders and priests... Nonetheless, she points at the ṛc RV, I.110.2, where it is explicitly stated that Savitar makes a sacrifice, and observes that the latter explanation of the Gods as tribal heroes, who make sacrifices to the Gods, is in many cases internally inconsistent and objectionable, as the Gods carry out and enjoy sacrifices at the same time.

Difficult astronomical concepts were interpreted in her translation in a down-to-earth naturalistic manner being deprived of their meaning. Her translation helped to clarify a number of linguistical issues, but it did not give the answer to the most serious questions: who were the 'wise ṛṣis' and the 'great devas' in context of astronomy,

what was ritualistic or other function of the Vedas, and what was hidden inside latent meanings, etc.

Calendar Chronoprogramming (Kalpa vedāṅga)

The science of ritual was expounded first in the Brāhmaṇas than in a number of special treatises. They analyse not only the practice and theory of ritual, but also reflect main developments in the field of ethics, sociology, logic, analytics and systematics. Kalpa followed the lines of the Vedic epistemology, which was focused on the theory of pramāṇas (sources and methods of correct knowledge.) It contained not only the system of specific rules of the Vedic recitation, technique and analysis of the structure of rituals, but also explanation (paribhāṣa) of the metarules of their application and classification of rituals. Kalpa gives also the rules of behaviour for all humans of all ages and professions and describes an ideal society and universal state organized around its cosmic calendar ritual.

Really, these textbooks were the original constitutions of an ideal chronosociety and global state, which formulated principles of calendar, political science, sociology, law, ethics, religion, pedagogy (and sometimes, rules of etiquette, cosmetics and so forth.) The dharmasāstric concept of global polity became an ideal for later governments of ancient and mediaeval India.

Kalpa-sūtras consist of śrauta-sūtras (the rules concerning solemn Vedic ceremonies and public holidays,) śulvasūtras (rules of measurement and construction of calendar geometric altars,) grhya-sūtras (textbooks of 'domestic' calendar ceremonies) and dharma-sūtras ('constitutions' of ideal Vedic state and academies-observatories called pariśadaḥ, 'session,' 'academy,' as well as codes of ethics and law concerning society and family as basic units of

calendrically organized chronocosmos.)

Dharmaśāstra (poetic didactic works against prosaic dharmasūtras) can be determined as the main juridical-religious-ethical doctrine determining the four sides of life (caturvarga) of four classes of society in the perspective of four periods of life. Its main objective is full realisation of man in an ideally organized ecological society.⁵²

The other important branch of Vedic Human science is arthaśāstra, political science or philosophy and science of government. It heavily relies on political science and law, science of agriculture, veterinary medicine, environment-oriented legislation, chemistry and metallurgy, town planning and military science.

The third ethical discipline still of secular orientation is the philosophy of erotica, systematising rules of sexual conduct (kāmaśāstra.)

The fourth science called mokṣaśāstra discusses the highest goal of life and means of liberation of the soul from fetters of worldly existence.

Kalpa ('riveting' of ceremonies) is usually associated with rituals and is considered as their later overview, a synopsis of the ideas of the Yajur-Veda and the Brāhmaṇas regarded as its primary sources. In this connection, let us remember that the Brāhmaṇas are an integrated part of the Four Vedas, among which the three smaller Vedas are entirely depended on the Ṛg-Veda.

Taking into account a hostile character of the Western indology, purposely aspiring to mystify the Vedic chronology, it is impossible to take seriously the statement that the kalpa-sūtras had been created millennia after the composition of the Veda-saṁhitās. Actually, as

⁵² Mihailaw, M. Pra farmavan'ne i razvoj idejaj ekaljagičnae etyki w starażytnaj Indyi. In: Vieda: Pracy Belaruskaga Instytutu Ewropy (Belaruskaga navukova-gumanitarnaga tavarystva), Vypusk 1, Mensk, 1993 (About the development of the ideas of ecological ethics in ancient India. In: Vieda: Works of the Belarussian Institute of Europe: Belarussian scientific-humanitarian society, Minsk, 1993). (In Belarussian.)

the other Vedāṅgas, they logically predate the creation of the Vedasamhitās, formulating principles of their astromythological order according to calendar-chronometric performance and astronomical observation.

Moreover, this discipline is not a guidebook on sacrifices as it is usually characterized, but an original science of programming the movement of stars with such devices as calendar ceremonies, church chanting, geometrical observatories, and also brick annual chronomemorials (calendar computing brick machines,) nowadays called ‘altars in honor of the god Agni.’

Kalpa-sūtras govern performance of the Vedic chronopoems and calendar ceremonies as computer programs allowing watching the course of stars and time with the help of recitation, construction of verified calendar memorials or altars and other procedures.

Kalpa-sūtra manuals preserved several traditions of astronomical observation peculiar to corresponding editions of the Vedasamhitās.

Primary Sources of the Vedic Etiquette

The Vedic sociology is described in the extensive collection of dharma-śāstras called collectively the ‘smṛtis’ (‘memorandums.’) But a lot of issues concerning morals, beliefs and law are skillfully twisted in the fabric of scientific and mythological compositions and occupy an outstanding, if not the leading, place in creativity of Sanskrit singers, prophets, teachers, saints and wise men. Sets of moral precepts – at times compositions of this sort – are included in Vedic and Tantric works, Buddhist, Vaishnava and Jaina Āgamas.

Names of some nominal composers of the Dharma-śāstras reflect, apparently, very ancient Vedic tradition of Indo-European, maybe, of even more ancient times of Afro-Asian and Indo-European language unity. I may cite the assumption of William Jones about identity of names of Manu, the son of Brahmā, and the son of Jupiter Minos, who both were considered as the first legislators,

one in India, and another in Greece. To my mind, the pair of names Gautam – Adam belongs to the same class. Whereas Adam was the first person expelled from paradise, Gautam was the legislator of the second Indian Age, called Treta-yuga (following Satya-yuga, the Age of truth, light and happiness, corresponding to spring, the Greek Golden Age and the Biblical paradise.)

Anyway, the tradition attributes the deepest antiquity, more likely, even eternity, to these wise men and their compositions. Their glory has caused in Sanskrit and vernacular languages, in turn, huge quantity of imitations, poetic adaptations, popular textbooks of state law, stating essence of the ‘smṛti’ in condensed accounts.

The most known works of this sort are attributed to the Vedic deities, personifications of the zodiac (Dakṣa;) the Moon’s phases: Aṅgiras, Manu, Atri, Yajñavalkya, Vyāsa, Parāśara, Harita, Apastamba, Katyayana, Śankha, Likhita, Śatatapa, Vāsiṣṭha; and planets: Samvarta and Bṛhaspati (Jupiter,) Uṣanas-Śukrācarya (Venus,) Viṣṇu and Yama (Saturn,) Gautama (maybe, Mars.) Thus, some names are identified definitely as lunar deities, and two as Jupiter and Venus, which were instructors of the devas and the asuras (personifications of the Moon’s phases of the bright and dark halves of the lunar month.)

P. V. Kane in his ‘History of Dharmaśāstra’ gives some more names which analysis does not leave the slightest doubt of their mythological-astronomical-calendar origin: Agastya (a southern course of the Sun,) Ātreya (offspring of Atri, the Moon,) Babhru (The Sun,) Vaijavaya, Vaikhanasa, Vaiśvanara (Agni, the Full Moon) Vamadeva, Jamadagni (father of Viṣṇu-Paraśurama, Saturn,) Varahī (the spouse of Viṣṇu the Wild Boar, Saturn,) Viśveśvara (the Lord of the universe, the Moon,) Vyaghrapada, Gaveya, Galava, Garga, Jabala, Indradatta (offspring of Indra, the Full Moon,) Iśana (Śiva,) Kavasa, Kanaḍa, Kapinjala, Karṣṇajina, Kratu, Lalla, Lomaṣa (the ‘Hairy’ Sun,) Marici (the Bright Sun,) Nārada, Paithinasi, Prahlada, Pulaha (son of Brahmā, node of the lunar orbit,) Ṛtuparṇa, Ṛṣyaśṛṅga,

Sanatkumara (son of Brahmā,) Sankhyayana, Saptarṣi (seven planets or seven stars,) Satyavrata (Zodiac,) Śanmukha (‘Six-faced,’ the son of Śiva) and Skanda (the Moon born at constellation Kṛttikā,) Soma (the Moon,) Sumantu, Upakāśyapa (assistant of Kāśyapa, the Sun,) Hiranyakeśi, Candra (the Moon,) Chagalya, Cyavana (the Waning Moon,) Śākala, Śakaṭayaṇa, Śantanu (Śiva, the New Moon, husband of Gaṅgā, the river of the zodiac,) Śatyapana, Śaunaka, Śunahpuccha, etc.) The significant part of these names is easily identified as personifications of the lunar and astral phenomena. It is clear that all other names or nicknames of the Vedic ‘gods’ in this line designate personifications of the solar-lunar, astral and planetary phenomena.

Thus, in conclusion I need hardly emphasize the point that moral principles in the ancient system of programmed astronomical-mythological education were expressed and consecrated through the laws of an eternal calendar, while the latter were spiritualized by human feelings and ‘idolized.’

Though some part of compositions is not found yet, the doctrine of the dharma-śāstra is enough clear. Compositions differ in particulars and examples, all the same they are united by a common theme and style, that at times not only separate verses and propositions, but the whole chapters pass from one to another. This feature, as it is well known, characterizes also one hundred ‘Gospels,’ from which the Church recognizes as the initial ones only four.

Principles of the Vedic Etiquette

Ethics of the Vedas is optimistic and, despite heavenly character of all mythical personages, eulogize values of terrestrial life conceptualized by people of an epoch much more ancient and greater that it is scarcely imaginable.

The major value of Sanskrit culture of the Vedic times as, however, of all Indo-European civilization, undoubtedly, was a heavenly glory (‘śravaḥ’) acquired through familiarity with the heavenly ‘Word’ (Śruti) or ‘the Vedas’ (‘the Vedic sciences,’) covering prac-

tically all branches of knowledge. The ideal of this instruction was the broadest learning (certainly, including so-called natural sciences,) aesthetic refinement and moral harmony. The highest ideal of terrestrial human existence as it is formulated, for example, by Kṣemendra in ‘Hundred Verses about Good Behavior,’ was acquiring of glory and kind memory of descendants. Immortality was understood as life in human memory. The same ideal of achievement of glory and honor by deeds and feats was inherent also in Homeric heroics.

Later, the Vedic gods migrated to a Hindu pantheon, but their astronomical and scientific-symbolical meaning was gradually forgotten and they were transformed into simple objects of worship, mysterious abstract spirits of those symbols, which were designated by their names: Indra, the symbol of the full moon, emperor of the ‘devas’ or ‘bright lunar phases,’ is frequently treated as the god of thunder-storm and abundance; Agni, the Full Moon, as well as growing or waning Moon, becomes only the god of fire; Soma, the sidereal Moon, is imagined as the god of a sacred intoxicating drink (which some modern ‘wise men’ – what a straight thinking simplification – identify with a fly agaric tincture.)

Trying to illuminate human life with all its personal (biological,) public (family, state, military, and industrial) and spiritual (moral) needs, ancient Indian legislators concentrate their efforts on three coordinated subjects: acāra – personal responsibility, duty, preachment of moral conduct and etiquette; vyavahara – public and legal establishment, description of state trials, and prayaścitta – expiation of fault, punishment and a repentance of sinners.

The preachment of moral conduct is a sample for youth, a moral ideal; the description of crimes and punishments is not the code of rules of legal proceedings as sometimes believed, but a caution, legal education; and the description of repentances in ‘crimes of idea and feeling’ – the indication of a way how to prevent crimes, effective preventive maintenance of crimes. Without this moral, spiritual side of the self-improvement remains unfulfilled.

Ancient wise men realized that abruption of law from customs (etiquette,) on the one hand, and from 'religious' repentance, expurgation of conscience (ethics) – on the other hand – deprives 'law-tree' of its roots and flowers. As such, it cannot give healthy high-grade fruits.

Such sins as murder, robbery, adultery, crapulence, an orgy of eating, falsehood are not only infringement of respectable conduct and customs; they are direct displays of passions: anger, greed, lust, thirst, famine, confusion of mind and ignorance.

A person having assimilated rules of hygiene, law and conduct as well as rules of piety and repentance was directed by his conscience towards achievement of corporal, intellectual and spiritual perfection.

Questions of chronocosmic Dharma are central in the 'Śruti,' especially, in the Upaniṣadas, but most scrupulously, they are explained in the Itihāsas (for example, the 'Mokṣa-Dharma,' 'Foundations of Liberation,' of the Mahābhārata,) in the sacred books (Āgamas) of Śivaites, Buddhists and Jainas, in the Purāṇas, in mīmāṃsā textbooks which are concentrated mainly on the analysis of this concept, in the Nīti-Śāstras, in the Dharma-Sūtras and Dharma-Śāstras.

The most popular among these treatises was 'The Laws of Manu, the Sun' (the 'Mānava-Dharma-Śāstra') by virtue of its antiquity, comprehensiveness and authority of the symbolical author. It was created, according to tradition, for the Kṛta-Yuga, the Age of light and truth, while the 'Smṛtis' of Gautama was intended for the Treta-Yuga, that of Śaṅkha for the Dvapara-Yuga, and that of Parāśara for the Kali-Yuga, which is equated erroneously with our epoch.)

The 'Smṛtis' really reflected certain patterns of social life. Therefore, Parāśara's code proclaimed agriculture the only worthy occupation of the Kali-age, obligatory for all casts, including Brāhmaṇas. Actually, the Kali-age is connected with winter (in India, similar to European summer,) and also with the three nights period of a new moon, when the night sky seems black as the ploughed black earth,

and stars remind the uncountable plowmen moving from the East to the West along their furrows.

The 'Parāśara-Smṛti' rendered significant influence on public thought of medieval India, when the country was under massive Muslim invasion as if plunged into a gloom of winter or new moon Kali-Age.

Kṣemendra repeatedly quotes the 'Parāśara-Smṛti' in his textbook of morals named 'Nīti-Kalpa-Taru' ('Wish-Tree of Good Conduct.')

Public duty, according to Kṣemendra, undoubtedly, means the cherished ideals of Parāśara: gardening, agriculture and cattle breeding, active helping others and protection of the native land with weapon in hands against enemies.

Thanks to the Kalhaṇa's 'River of Kings,' it is known that brāhmaṇas belonging to the highest Sarasvata branch were engaged in agriculture and were widely involved in military service. It supports the view of a number of modern thinkers such as Vivekananda, Aurobindo, Mahatma Gandhi according to which four yogas (bhakti or love and reverence, karma or work and ceremonies, jñāna or knowledge and rāja-yoga or self-discipline) do not contradict, but supplement each other and should be harmoniously integrated into behavior of each person. I can add that this integration should be done according to the age and the temperament of a person.

One more advantage of ancient Indian wisdom is the historical-social approach to ethics based on notion of four sides of life (Dharma or public morals, Kāma or romantic and family morals, Artha or economic morals and Mokṣa or religious ethics of redemption.)

The concept of 'four' pervades Vedic thinking being based in division of the month into four weeks, partition of the year into four seasons and splitting up of a day into four watches.)

Human beings have four temperaments (brāhmaṇas, magnanimous, sanguine persons; kṣatriya, imperious, choleric persons; vaiśya, enterprising, hardworking, phlegmatic persons; and śudra,

sad, melancholic.) Social quadruple structure was supplemented with a similar physiological partition in four ages (young, average, elderly and senile) and psychological arrangement of four ways of concentration (bhakti-yoga – unity with ‘deity’ through his ‘reverence;’ karma-yoga – through performance of ceremonies; jñāna-yoga – through knowledge and rāja-yoga – through self-control.)

Besides, legislators have correlated the ethical doctrines with four yugas (‘ages,’ that is, seasons of the year or a cycle of years such as Meton one, or phases of the Moon): the Kṛta-Yuga – ‘perfect,’ ‘skilfully made,’ ‘quadruple,’ also called Satya-Yuga, the ‘Age of Light and Truth’); Treta-Yuga ‘triple’ (corresponds to the ‘cow,’ Night, on three feet); Dvapara-Yuga, ‘double’ (two feet); Kali-Yuga, ‘single’ (one foot.)

Distribution of morals in accord with the ages ordered by a decrease of light and virtue shows up comprehension of ambiguity and contextual conditionality of moral instructions, their subordination to circumstances and natural course of time.

This approach is reflected in the ‘Works and Days’ of the Greek poet Hesiod, VIII-VIIth centuries B.C.E.; and in the general, monthly and celebratory ‘Menology,’ the Christian books, in which daily Church chanting in honour of the virgin and saints are divided by months, as it is signified by the Greek word ‘Menology;’ and in the ‘Great Menology’ of Makariy, XVIth century; as well as later in L. N. Tolstoy’s basic didactic works, ‘the Calendar with Proverbs for 1887,’ ‘Thoughts of Wise People on Every Day’ (1903,) ‘the Circle of Reading’ (1906-1908,) ‘On Every Day. The doctrine of Life in Sayings’ (1909-1910,) in which ideas of different centuries and peoples about good, true life are ordered according to days, weeks and twelve months.

Calendar Ceremonies and Memorials

The Vedic calendar ceremony combining the Vedic mantras and construction of dismountable memorials of strictly determined and

geometrically ideal form with carefully measured and burnt bricks is usually labeled a 'sacrifice.' In truth, it was a 'sacrifice to knowledge and wise men' as it is referred to in the Dharma-Sūtras.

In general, it is necessary to note that highly intellectual tradition of the Vedic 'sacrifices' is anything other than an astronomical allegory. The four other basic versions include 'reception of a visitor – the Moon,' 'feeding of animals – constellations' by scattering food around the 'house' – the universe, 'remembrance of ancestors' – the passed months, and 'observation of deities' – stars.) In fact, it is a symbol of certain astronomical procedures of observation and calculation. Attempt to identify the poetic Vedic ceremony of the astronomical-mathematical observation with barbarous sacrifices is a limitation of early colonialist indology inherited, unfortunately, by modern scholarship.

The Śulva-Sūtras describe manufacturing techniques and applications of special brick of strict dimensions, outlines, areas and volume for accounting dismountable memorials or databases called vedis ('data,' a monument, a memorial.) That term was incorrectly understood by first indologists as Vedic 'altar,' 'prothesis' or 'crecence.'

The Śulva-Sūtra, which is an addition to Śrauta-Sūtra of Baudhāyana, contains alongside with mathematical instructions for erection of the Vedic 'altars' one remarkable theorem of mathematics (usually attributed to Pythagoras, c. 582 – c. 500 B.C.E., Greek philosopher, mathematician, and religious reformer,) first stated for a special case of a square (the form in which it had been found,) then for the general case of a rectangular: 'the Diagonal of a rectangular gives the cumulative area, which length and breadth give separately.' This and other examples of advanced mathematics of Baudhāyana, as A. Seidenberg, an American mathematician has shown, are a source of similar mathematical methods and 'discoveries' in Greece and Babylonia, some of which have been dated 1700 B.C.E.

The concept of Geometry in India emerged from the practice of

making astronomical memorials of the celestial ‘fires’ in geometrical shapes. The treatise of ‘Sūrya Siddhānta’ (4th century C.E.) describes details of trigonometry, which were introduced to Europe 1200 years later in the 16th century by Briggs.

Indian researchers suppose that the word ‘Geometry’ seems to have emerged from the Indian word ‘Gyāmiti,’ which means ‘measuring the Earth.’ The word ‘Trigonometry’ is similar to the word ‘Trikonamiti’ meaning measuring triangular forms.

I can add that the name ‘Baudhāyana’ means actually the ‘Path’ of Mercury or Jupiter, because ‘Budha’ and ‘Bodhanaḥ’ are the names of Mercury, and ‘Bodhānaḥ’ is the name of Jupiter. The name of the symbolical author of the Śulva-Sūtra relates its subject to the Vedic chronogeometry.

The ratio of the circumference to the diameter of a circle is known as Pi, which gives its value as 3.14592657932. The Baudhāyana’s Śulva-Sūtra mentions this ratio as approximately equal to 3.

Āryabhata worked out the value of Pi to the 4th decimal place as $3 \frac{177}{1250} = 3.1416$. Centuries later in 825 C.E. the Arab mathematician Mohammed Ibn Musa said that the value $\frac{62832}{20000}$ (3.1416) has been given by the Indians.

The first indologist, who paid attention to texts of the Śulva-Sūtras, was A. S. Burnell (1840 – 1882,) who simply could not know anything about the not yet discovered Proto-Indian civilization and consequently could not examine

them in correct chronological perspective. Then, these texts were thoroughly studied by A. Burkem, G. Thibeaup, B. B. Datta, and others. They have discovered a significant material concerning geometry. However, they could not comprehend its value for astronomy, as then no one



would have suspected the Vedic calendar to possess secret codes.

D. Chattopadhyaya's attempt to rethink a huge scientific material of these texts in a context of the Proto-Indian civilization has also ended in a fiasco, for it was anti-Vedic. As Chattopadhyaya ingenuously admits, his purpose was not the aspiration to prove that priests were not capable to develop geometry, but the desire to convince readers that exactly the Vedic priests were not capable of it.

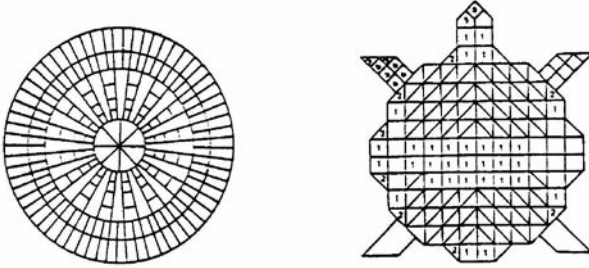
He has understood that the work of many generations underlies the geometry of the Śulva-Sūtras, that they use exact geometrical terminology developed in details for the description of bricks of the diversified form along with standardized technology of their manufacturing, however, being the captive of his harsh criticism of the Vedas, he could not grasp true mathematical-astronomical purpose of this technology, and, on the contrary, even more stagnated in the prejudicial attitude generated under influence of works of the West-European ethnographers of the XIXth century, quite often impregnated with frank chauvinism, and marxists-materialists of XXth c. Certainly, these prejudiced judgments should have been 'proved' by citations and scientific references to modern Western and Indian authorities of naturalistic school. This part of the book is irreproachable.

The so-called Pythagorean Theorem attributed to Pythagoras who lived around 500 B.C.E., but which was first proven in Greek sources in Euclid's 'Geometry,' written centuries later, was understood in ancient India, and was in fact proved in the Baudhāyana's Shulva-Sūtra, a text dated to circa 600 B.C.E. Seidenberg showed that the thesis that Greece was the origin of geometric algebra was incorrect, 'for geometric algebra existed in India before the classical period in Greece.'

Knowledge of mathematics, and geometry in particular, was necessary for the precise construction of the complex Vedic altars, and mathematics was thus one of the topics covered in the Brāhmaṇas. This knowledge was further elaborated in the Kalpa-Sūtras, which gave more detailed instructions concerning Vedic ritual. The oldest and most complete of these is the previously mentioned the Shulva-

Sūtra of Baudhāyana. This text was composed about a century before Pythagoras. India was a source for Greek geometry, transmitted via the Persians, who traded both with the Greeks and the Indians.

At the same time, the calendar problematics of these texts is axiomatic: the areas of bricks were precisely correlated to the most important Vedic meters and chronological constants, such as quantity of days, hours or minutes in one year and so forth.



The Vedic memorials: a) a wheel; b) a turtle

Besides, the ‘Taittirīya-Samhitā’ of the Yajur-Veda gives the full list of identifications of the devas with the body parts, syllables, mantras, parts of the year, bricks of a ritual altar, cardinal directions, seasons, poetic meters, etc. The Vedic brick altars had calendar-astronomical assignment. Unfortunately, scholars being not capable during long time to decipher these riddles declared them religious-magical superstitions or literary metaphors.

Bricks of annual altars were measured by a special string with nodes. By the way, this method of calendar calculation was widely used by ancient Kechuas, Chinese, Persians, Slavs till the period of the Middle Ages, Finns (up to the end of the XIXth century,) Polynesians and Negroes of East Africa (till today.)

Two possibilities suggest themselves to me now. The most ancient chronologists used first gobs of clay for calculation of days. Later these gobs of clay were replaced with bricks during the long period of perfection of memorials named citis and agnis (‘fire’ al-

tars.) Use of fire in these agnis, evident from their names, during annual holidays, resulted in discovery of manufacturing techniques of burnt bricks, Śulva-Sūtra geometry, and Proto-Indian astronomically oriented architecture. The contrary argument is the very reverse of the truth! Here, I categorically insist on that the theory of the Vedic calendar being borrowed by the founders of Harappan cities went criss-cross from the start. The Proto-Indian cities were constructed with burnt bricks in accord with already developed astronomical theory! Those who elaborated a perfect brick fabrication technology with precision up to tenth of millimeter and could assemble dismountable unmortared altars of the height of a five-floor palace, undoubtedly, could construct the whole cities using gypsum cement and other materials, which were at their disposal, as far as we know. Founders of the Proto-Indian cities could not be any other architects-astronomers (the history wot them not) as creators of the Vedas and calendar brick memorials! Nobody during that period applied burnt bricks in such scales and nobody had such high technology of its manufacturing!

Calendar-Astronomical Observatory

The Vedic Academic campuses and their raised fortified platforms where the Vedic ‘actions’ took place were strictly astronomically oriented.



Pool of the Indus temple-observatory

This gives us the right to name them ‘observatories.’ Having looked more closely, we notice that the platform reminds assembly of several as though circled objects, which are located symmetrically in the form of a cross, and obviously symbolically representing the sky, lunar month, season of the year, year or a cycle of years.

Let us deliver ourselves for a moment from naturalistic theories’ captivity, trammels of superstition and prejudice seeing in our ancient ancestors savages and superstitious people, and let us look at the Vedic constructions without bias, aspiring to find not an abstract philosophical and pseudo-historical, but a logic explanation. Fortunately, due to S. Kak’s efforts, we have an opportunity to look at them from purely astronomical point of view.

The altars symbolized different parts of the year. In one ritual, pebbles were placed around the altars. 261 representing quantity of bordering stones around a square of ahavanīya, ‘invoked fire’ of the (east) altar of the western part of the Vedic ritual platform; 21 stones around garhapatya, ‘domestic fire’ of the (western) altar of the same platform, and 78 stones around the fireplaces (dhiṣṇyas) and group of ‘assessors’ (sadas) in the western part of mahāvedi (‘the great altar.’) S. Kak noticed that 21, 78, and 261 stones, which constituted, respectively, the number of the pebbles around three altars, add up to the 360 days of the year. According to him, there were other features related to the design of the altars, which suggested that the ritualists were aware that the length of the year was between 365 and 366 days.

261 stones, most likely, symbolize nine months of 29 days each that is equal to three seasons of a year. Combining 78 and 261, we get the Vedic number 339 considered by S. Kak in other connection and meaning quantity of the solar disks on ecliptic in day of an equinox. The number ‘339’ was revealed through our analysis of the mantras correlated with divisions of the lunar zodiac, called nakṣatras (‘night transitions.’)

It seems that the number ‘339’ is present in quantity of blocks of

the pyramid of Cheops (2300000,) as this quantity is multiple to the period of the nodes of the lunar orbit and an average of solar disks on the half of ecliptic: $2300000 : 6795 = 338,5$. Significance of the number '23,' which reminds us the 23rd parallel, is indicated by 23 statues of the pharaohs in the bottom temple of pyramid of Khafre (late 26th century B.C.E., Egyptian king of the fourth dynasty, son of Cheops, builder of second pyramid at El Giza.)

In general, mathematical configuration of all important Egyptian constructions and astronomical principles are discernable in their layout.

So, above the funeral chamber of a tomb in Saqqara, there were 27 rooms. The holiday 'opeth' during which the god Amon was transported from Karnak (a village in E. Egypt, on the Nile, the northern part of the ruins of ancient Thebes) to Luxor (a town in S. Upper Egypt on the Nile with ruins of ancient Thebes) continued 27 days. Strabo (63? B.C.E. – C.E. 21?, Greek geographer and historian) telling about the majestic subterranean-ground palace constructed on the coast of the Lake Moeris near a pyramid in Gavara of Amenemhet III and consisting of 3000 rooms, noticed that the number of courtyards was equal to 27, as well as quantity of nomes (provinces) of Egypt. Number 27, undoubtedly, specifies lunar mansions (nakṣatras,) and, hence, points at the lunar Zodiac or 27 days (for example, 14 draconian months make synodical period of Saturn, which is a multiple of the cycle of the nodes of the lunar orbit.)

Having added to 261 days 99 more days (which is formed by addition $78 + 21$,) we get a 'ceremonial year,' consisting of 360 days; if to add 100 days instead of 99, we get the 'year of Jupiter' ($361 \text{ day} = 19 * 19, \frac{1}{12}$ of sidereal period of Jupiter equal to 4332 days or $19 * 228$.)

All these numbers are in coordination with each other, and, besides, with astronomical Vedic notions and mythology. They lay directly on a surface, and it is necessary to complain only about popular fallacies and falsities of the process of knowledge, when you

see that both the opponents of the Vedas and their supporters do not notice them. Maybe, sometimes someone pays attention to them, but the isolated facts do not built a theory without especially intensive efforts of immersing in abysses of the past, exotic methods of calculation and coding. And these pearls of ancient knowledge lay at the bottom of abyss of our ignorance, self-confidence and arrogance.

Quite probably, here is not only the information about year, but also a four-year solar cycle, which consists of four years of 360 days and an insertion of 21 days: $4 * 360 + 21 = 4 * 365.25 = 1461$.

Four years could to be designated, for example, by agnidhra, uttaravedi, mārjalīya and havirdhana.

This 4-year cycle has been reconstructed by me mathematically from the mantras of the four Vedas and separately from the mantras of the Sāma-Veda (as it will be shown below,) therefore, its presence here in geometry of the Vedic calendar observatory is quite natural.

On the other hand, three years of 360 days could be supplemented three times (what, probably, also was symbolized by agnidhra, uttaravedi and mārjalīya, located in a circle) by five fire-places dhiṣṇyas (standing as a separate group) forming three years of 365 days and once (designated with the ‘hut-temple’ havirdhana, standing independently in the center,) supplemented by six days (designated by group of $5 + 1$.) For example, when sacred fire as a symbol of the current year was enkindled in turn in agnidhra, uttaravedi and mārjalīya, then at the end of every year five fireplaces were lighted up day after day. Alternatively, five fireplaces could be lit during three years and, on the fourth year, the sixth fireplace was lighted up inaugurating the leap year.

By the way, it becomes clear why these ‘observatories’ were located in citadels on the raised platforms open to the sky and behind strong walls. The protection of the calendar and observatories in an ancient society was a prerogative of the government. It would be very easy to malefactors or simply careless people, be these ob-

servatories in an unprotected place, to break the arrangement of the fireplaces and it would mean the disgraceful end or, at least, mess in long-term calendar observations. That, certainly, was prohibited under all circumstances.

1130 editions of the Vedas and a 4-year calendar cycle

All the set of ancient Indian settlements of Indus type can be considered as a complex of the Vedic observatories.

Their small sizes, their astronomical orientation, the presence in many of them platforms with the fireplaces, the equal building plan indicating the equal status of inhabitants (it is constantly emphasized in the Vedas, that the Vedic singers-astronomers are unanimous and equal,) their most dense location in droughty region, where the most part of the year the sky is cloudless, and even their quantity (one-two thousand, – all specifies them as sites of the Vedic astronomical academies (śākhās) which number, according to tradition, was 1130 (one sixth of the cycle of the nodes of the lunar orbit.) By definition of the ancient grammarian Pātāñjali, the Ṛg-Veda had 21 editions, the Yajur-Veda 100, the Sāma-Veda 1000 and the Atharva-Veda 9. The total sum of all editions was 1130, and six such subperiods are only 18 less the period of the lunar nodes ($1130 * 6 + 18 = 6798$.)

By the way, could not this number underlie quantity of performances of Saṁhitās which gives 1461 days?

There are some possibilities of correlation of the quantity of Vedic branches with that rather important calendar solar cycle:

1) If performance of the Sāma-Veda could serve as a marker of one day, the Ṛg-Veda and the Atharva-Veda were executed each in two days whereas the Yajur-Veda accompanied with complex ceremonies could be performed in four days, we get 1460 days.

$$1000 + 2 * 21 + 2 * 9 + 4 * 100 = 1460.$$

The last 1461st day of the cycle could be marked by the perfor-

mance of all the Vedas.

2) If performance of the Ṛg-Veda = 3 days, and the Atharva-Veda = 1.3 day, in this case we have $1000 + 200 + 63 + 11.7 = 1274.7$ days. It is a half-year (186.3 days) less the solar 4-year cycle.

The cycle of 1461 days can be represented as three years of 367 (1101 days) plus 360.

As you will learn later, performance of the Sāma-Veda, really, could take one day and that of the Yajur-Veda 2 days. Hence, these two Vedas in all their 1100 'editions' cover the period of 1200 days. Such period is present as one of multipliers of the Life of Brahmā; it is deciphered repeatedly on Proto-Indian seals. This, actually, makes three years and one third or 360 'steps' of the Sun of $3\frac{1}{3}$ days. To build a 4-year period, we need 261 days more. However, this is namely the quantity of stones around a square ahavanīya in the main part of the astronomical Vedic platform! Most likely, we have come a long way in our work. If from 261 to take away 9 readings of the Atharva-Veda, the residue is 252 days, which can be explained as four seasons consisting of two months of 31.5 days or 63 days each. 21 performances of the Ṛg-Veda of three days each gives us exactly 63 days!

The reading of the Ṛg-Veda as well as the quantity of its mantras was really connected with the three days!!! (See ch. about chronometry of the Ṛg-Veda.)

Thus the month of 31.5 days could be used in a draconian year, as 11 such months (reminding 11 circles in upper part of the mahāvedi) make the period, in which the Sun comes back to the same node of the lunar orbit.

Having executed in correct tempo three Vedas and four times the cycle of the Ṛg-Veda (that is, 21 time every year, as though reminding about an insert of 21 days,) we get four solar years consisting of the following combination of readings of the four Vedas:

$$3 * (250 + 25 + 21 + 3) + (250 + 25 + 21) = 1193.$$

This formula expressed in days looks like:

$3 * (250 + 50 + 63 + 3) + (250 + 50 + 63) = 3 * 366 + 363 = 1461.$

Year of 366 days is described in the Vedāᅅga-Jyotiᅅa, belonging to the ᅤg-Veda, and is present in monthly-consecrative code.

Let's not exclude that agnidhra, uttaravedi and mārjalīya could mean three months of 33 days, and together a season of 99 days (as in case of $78 + 21 = 99.$) 33 days, being multiplied by 11 months (circles at the top of a platform,) gives a year of 363 days, necessary in the above formula. Such three years supplemented with a year of 360 days and an insert of $11 + 1 = 12$ days (372 days) form again four solar years of 365.25 day!

Thus, the astrocalendar symbolics of the Vedic observatories is logically coordinated with the quantity of these observatories and quantity of the Vedic academies (śākhas) confirming belonging of the creators of the Vedas to the Proto-Indian civilization. The Vedic schools and astronomical platforms have started 'talking' in perfect unison describing the same calendar phenomenon in rather harmonious, almost in the same mathematical 'expressions'! There is no reason to continue labeling this civilization 'Harappan.' It is the Vedic civilization!

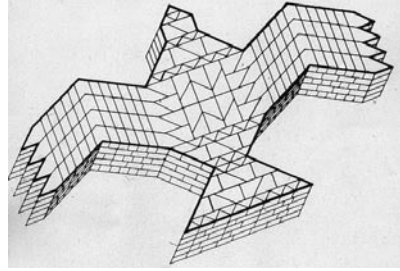
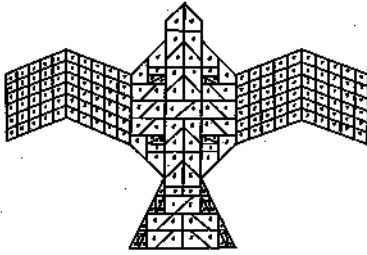
Calendar memorial

That the platform and especially so-called 'altars' concerned calendar cycles, became clear to me after perusal of the book of D. Chattopadhyaya, in which he has described geometrical features of bricks and altars. Later, I have found additional circumstantial evidence having studied arguments and examples of S. Kak.

The Śatapatha-Brāhmaᅅa (10.2.3.18) tells us that Prajapati ('Father of all beings' or 'the Lord of everything,' Time) had been created seven-fold and then began to grow, while his body has not reached 101 parts. And these parts became equal to seven parts.

S. Kak points at that the Baudhāyana-Śulva-Sūtra (5.6) contains even a mathematical explanation which shows how the altar reaches the size x , increasing by unit m , changing from 1 up to 94, according

to the equation: $x^2 = 1 + \binom{2m}{15}$. At $m = 94$, monument reaches the area 101.5 sq. puruṣas.



Vakra-paksha-shyena citi
Basic falcon memorial with the curved wings
(well, it is amazingly similar to a spacecraft, isn't it?!)

To tell the truth, S. Kak, in my opinion, has tried unreasonably to find here 95 years, having equated 7.5 sq. puruṣas of the basic memorial to one year, and then 94 sq. puruṣas to 94 years. 95 years equal to five Meton cycles can be hardly proved by Kak's reference to the concept of Prajapati. He 'was born' seven-fold and, when he became of the size of 101 parts, he remained equal to the initial seven parts. It can speak only about his interlinking with the nineteen-year cycle containing seven intercalary months. In 95 years period the number of such months accordingly would be 35; that does not find substantiation in a falcon calendar monument.

Existence of the 95-year cycle in the Vedic tradition, however, proves to be true with a circumstantial mentioning of a 2850-year cycle in 'Romaka-Siddhānta.' This big period is a 'celestial month' in relation to the 95-year cycle considered as 'divine day':

$$95 * 30 = 2850.$$

S. Kak makes further one more wrongful assumption, equating the basic altar to a symbol of the 5-year yuga or cycle on reason that it, supposedly, will consist of five layers. That results in postulation of the period five times greater than the 95-year cycle: $5 * 95 = 475$.

In this case, he again equates one layer of bricks to one puruṣa. That, certainly, is in any way not justified logically and contextually. Such period of 475 years, nevertheless, is quite probable theoretically,

representing $\frac{1}{6}$ of the period of 2850. Noteworthy, the quantity of days in such a period of 475 years is given in a binary code, read by padas, in 52 mantras of the 164th hymn of the first maṇḍala (see the chapters about the binary and ternary codes in the Part II.)

The basic falcon memorial was created from 1000 bricks having various geometrical forms, strictly measured proportions, areas and volumes. They were assembled in five layers of 200 pieces without a mortar according to special rules providing overlapping of joints by the top bricks for durability. The general area of the basic module was equal to 7.5 square puruṣas (the person with hands upwards = about 2 m,) that made $7.5 * 14400$ sq. aṅgulas = 108000 sq. aṅgulas (sq. 'fingers.'). One layer (200 bricks) is equal to 1.5 sq. puruṣas, 1 sq. puruṣa is equal to 133,333... average bricks. Then, the area of 1 sq. puruṣa was added 94 times (12533.333... bricks in all) until the area of 101.5 sq. puruṣas (13533.333... bricks) was reached with 67.5 layers and the height of 432 aṅgulas or 13.5 janus, 'knees,' (7 m and 68.1 sm.)

It is necessary to note a 'suspicious' conformity of many altar numbers to the calendar-astronomical figures described in śāstras: 133,333... corresponds to ten nakṣatras in degrees; 432 aṅgulas hints at a thousandth part of the Kali-Yuga; proximity of numbers '1000' and '101' at 1101 day or three years of 367 days mentioned above in connection with quantity of the Vedic 'branches' or academies.

The areas of bricks contain characteristic multipliers of the four Vedas and the four yugas, forming the Life of Brahmā, such as 144 (144000 syllables in the Sāma-Veda,) 288 (288000 syllables in the Yajur-Veda,) 432 (432000 syllables in the Ṛg-Veda; 432000 'years' in the Kali-Yuga, 864000 'years') etc. Besides, some important memorial's areas also reflect the same numbers.

For example, one sq.puruṣa is equal to $120 * 120 = 14400$ sq. aṅgulas.

These numbers should be related, undoubtedly, to chronometry. The first thing that I have noticed was the opportunity to correlate

sq.puruṣa with a day. If to accept 1 sq. aṅgula for a designation of some time unit equal to 30 sec., quite good correlation of the sq.puruṣa with five days, and that of the whole memorial with two important years is found out:

$$14400 * 30 \text{ sec.} = 432000 \text{ sec.} = 5 \text{ days;}$$

$$108000 * 30 \text{ sec.} = 3240000 \text{ sec.} = 37.5 \text{ days.}$$

One layer then codes 7.5 days: $37.5 : 5 = 7.5$ days.

And all memorial as a whole expresses the number:

$7.5 * 94 + 37.5 = 742.5$ days. It is possible to explain it as the sum of days in a solar year and a year of Saturn ($364.5 + 378$), serving for the purposes of the coordination of a calendar with true year in 18 years:

$$17 * 364.5 + 378 = 6574.5 = 18 * 365.25.$$

18 years (though, lunar ones) appear below from the analysis of the quantity of bricks. The same 18 years are necessary also in ekselligmos, which we found out in the quantity of mantras of the four Vedas, as well as on Proto-Indian seals. Moreover, they are present in the first maṇḍala of the Ṛg-Veda, being expressed in a monthly-consecrative code as ten years of Agni and Indra and eight years of Venus (see the chapter about monthly-consecrative and printed codes in the Part II.)

The second opportunity of decoding is based upon concurrence of numbers 14400 sq. puruṣas and 14400 kāṣṭhas (=1 muhūrta or 48 minutes) in the 'Divya-Avadāna,' which is remarkable in that it postulates 432000 instants (nimeṣas) in a day, as many as syllables in the Ṛg-Veda.

Having accepted one sq.puruṣa equal to one muhūrta, we find out that the memorial enciphers 101.5 muhūrtas or 4872 minutes (approximately 3.38333... days.) This period, obviously, corresponds to a new moon, time of invisibility of a lunar disk during its conjunction with the Sun, and also – that, perhaps, is even more significant – is close to one of 108 'steps' of the Sun. Having multiplied this 'step' by 108, we get a solar year of 365.4 days. We shall remember

this computation as we shall face it again below in completely other reasoning. Such three years supplemented with a year of 365 days make four years of 365.3 days.

Calendar memorial and 4-year cycle

Names of bricks given in the ‘Taittirīya-Saṁhitā’ are reflection of a metric science and calendar mythology.⁵³

Bricks of different geometrical form have eloquent astronomical names: ‘Aditi’s or Sun’s bricks,’ ‘nakṣatras’ bricks,’ ‘Sky’s bricks’ (presumably, symbols of degrees of a circle,) ‘Season’s bricks,’ ‘Bṛhati bricks,’ etc. The Vedic meters are, obviously, correlated to the seconds of the circle and seconds of time according to our most proved hypothesis, which will be stated in the subsequent chapters about binary and ternary codes in the Part II.)

In a dismountable brick memorial, not only quantity of bricks of those or other outlines, but also their area mattered. The areas of some bricks indicate calendar values: a brick sapada has the area of 720 sq. aṅgulas (360 * 2,) a brick ubhai 180 sq. aṅgulas ($\frac{1}{2}$ of 360) and so forth.

A number of bricks reflect the most remarkable factors of the Vedic seals (see the last chapter):

$$6 * 6 = 36, 12 * 12 = 144, 18 * 18 = 324,$$

$$24 * 24 = 576, 20 * 10 = 200, 20 * 20 = 400, 30 * 30 = 900,$$

$$24 * 12 = 288, \text{ etc.}$$

We shall meet all these numbers in the chapters devoted to the Vedic mantras and printed signs.

If to consider the total of bricks as markers of days, then 13533.333... means exactly 39 Draconian years of 347 days or 37 Solar years approximately of 366 days. It is a good coordination. The conjunction of the cycle of the nodes and the cycle of draconian solar years in the light of the Vedic tradition is quite justified. Dedications

⁵³ D. Chattopadhyaya, Op. Cit. P.184–201.

to devas or to the lunar days in the first maṇḍala of the Ṛg-Veda together with the system of the Proto-Indian signs just contain 19 solar years and 20 draconian ones.

But having subtracted from the total sum of bricks of the falcon memorial the Meton cycle of 19 tropical years, we have 19 draconian years of 347 days: $365.2422 * 19 = 6939.6018$;

$$13533.333 - 6939.6018 = 6593.33... \quad 19 * 347.$$

It is a remarkable result revealing connection of the Vedic altars with the Vedic chronometry and the Proto-Indian calendar script. In the subsequent chapters, you will see that this connection is fundamental and proves to be true by a set of other textual and epigraphic evidences.

Well, and if a brick is a symbol of 0.1° , then 1 sq. puruṣa means 13.333° ($1353.3333...^\circ : 101.5$ sq. puruṣas,) which, obviously, represent one of the 27 nakṣatras. 7.5 puruṣas = 100° (as we remember, the Vedic observatory contains hints on numbers ‘99’ and ‘100’ in the form of groups of stones.) Hence, 101.5 puruṣas is equal to three cycles of 365° plus 258° . The last figure has a deficiency of 108° compared to the year of 366 days in order to form a solar 4-year cycle. 108 is a sacred number of Upaniṣadas in the Vedas. The area of the first five layers containing 1000 bricks measured in square aṅgulas is the same: $108 * 1000$. I wonder whether it is impossible to follow here the above-mentioned rule and to combine quantity of bricks with their aggregate area in order to get the four-year-ancient solar period.

Arguing further, we notice, that a ‘falcon memorial’ having the area of 101.5 sq. puruṣas contains $13.5333... basic$ altars of 108000 sq.aṅgulas. Hence, the aggregate area of the memorial will be:

$$13.533... * 108 * 1000 = 1461.6 * 1000 \text{ sq. aṅgulas.}$$

Having abstracted our mind from the factor ‘1000’ (which specifies calculation in kāṣṭhas, approximately, minutes,) it is necessary to notice that the number ‘1461.6’ accepted for a quantity of days corresponds to four years of 365.4 days (this year as you remember

has been got above in an absolutely other way) or

$$365 + 365.3 * 2 + 366.$$

The above period slightly exceeds the expected value only on 0.6 day what can be explained by approximation and roundness of our initial values. For example, we do not know what the area of the upper layer of thin bricks was. Probably, this special layer contained the amendment giving 4 years of 365.25 days. However, even that value which we have come at, is not so bad as not to see the calendar harmony contained in it. Moreover, this is one more very powerful confirmation of our basic Vedic model of interpretation: the four Vedas as you will see in corresponding chapters, in addition, fixed with their mantras namely that 4-year period!

Calendar bricks and planetary cycles

The sum of all bricks (13533.333) can be interpreted as a tenth part of a product $339 * 399 = 135261$, designating quantity of disks of the Sun in the day time sky in a synodical period of Jupiter (Bṛhaspati, 'the Great Father,' 'the Father of the Universe.')

The period of Jupiter appears also in the following formula, which, in my opinion, is the most plausible. Having compared the sum of bricks with the period of the nodes of the lunar orbit, with 18 lunar years, and with the Meton 19-year cycle and having admitted that 360 bricks designate degrees, we have the following period:

a) $6795 + 18 * 354.36 + 360 = 13533.48$ days.

6795 days is a cycle of the nodes of the lunar orbit according to Āryabhāṭa. It includes 17 synodical periods of Jupiter

$$(17 * 399) + 12 = 6783 + 12 = 6795.)$$

It is curious to note that '17' is called the number of Prajapati, who thus reminds Jupiter.

The product $18 * 354.36 = 6378.48$ days represents 18 lunar years.

The formular a) may mean that the cycle of the nodes of the lunar orbit corresponds to 19 lunar years. Without the 360° , the sum

is equal to 36 solar years of 366 days. The figure '360' might be interpreted as the number of months of 36-37 days in that period of 36 years. We will meet such months below (see Part II.)

Wings of the falcon in the first layer were made of 120 bricks $(30 + 30) + (30 + 30)$ and, obviously, symbolized four months of 30 days, as the second layer contained an exactly four months:

$(30 + 29) + (29 + 30)$, that is, $4 * 29.5 = 118$.

These figures are basic also in the monthly-consecrative code. Bricks of the first three layers were marked by three strokes symbolizing 'three locations of the sky or the year' and suggesting a year of 360 days or 360° ($120 * 3 = 360$.) The fourth and fifth layers were marked by plural strokes.

It is possible to note that if to add 56 (quantity of nakṣatras and upanakṣatras in the lunar zodiac, which two nodes pass in a cycle) to the total of bricks, two cycles of 6795 days are formed. Unfortunately, though such formula looks very harmonious, its substantiation can seem a little bit artificial... but not impossible. As we remember, a number of bricks carry the name of nakṣatras. It is necessary to assume that they were repeated two times at calculation of the bricks displaying movement of two nodes of the lunar orbit.

The chronometrical aspect of the falcon altar is supported by the Rigvedic account of the myth about Indra-falcon hunting for the Agni-pigeon. This 'hunt, apparently, specifies overlapping of two different cycles. Śibi, the wise emperor, presumably, the eclipsed Sun (RV, X. 179.1,) was glorified thanks to his generosity. To test his generosity, the pigeon, Agni (the first full Moon) has asked him for protection against a falcon, Indra (the second full Moon.) The emperor suggested giving a piece of meat from his own body equal to the weight of the pigeon... To counterbalance the balance, Śibi cut off a piece after a piece from his body, until sacrificed himself entirely having dropped his power in eclipse. Agni and Indra appeared before him in their true forms and generously granted him his former glory and power for his magnanimity (Mahābhārata, the

book 'Wildwood,' 130.19-20.)

Programming with Mental Bricks

Both Śankara and Rāmānuja, great medieval Indian interpreters of the Vedic philosophy, found it necessary to point at the so-called manomaya-citi or manas-citi ('figurative memorials.'). Śankara mentioned thirty six thousand their versions. That number is multiple to the figure of the Life of Brahmā and to the big period of 360000 years known to ancient Greeks.

In the case of chandas-citi ('a poetic altar') agnicit ('the builder of a fire altar') draws on the ground agni (altar) of the ordered form, and then passes all ordered process of construction, imagining, as if he places each measured figured brick in an appropriate place with a corresponding mantra. Mantras, really, are uttered, but bricks, actually, are not stacked.⁵⁴ Thus, the Vedic mathematical-geometrical poem modeling the chronocosmos was composed and performed!

This tradition of mental construction of the calendar memorial closely brings us to the understanding of the Vedas as calendar chronometric programs. Realization of a similar scientific plan assumed rather advanced philosophy of astronomy and mathematics, mathematical logic and special psychophysiology of long astronomical observation. So, kalpa gives us an important clue to the mantro-zodiacal code.



⁵⁴ B. B. Datta, Cit. in Chattopadhyaya, Op. Cit. Pp. 174–175.

10. TRADITIONALISTIC (PHONETIC) INTERPRETATION

Very often, scholars, as if having forgotten that the Vedic syllables have no meaning for those, who do not know their higher import, as they have the direct (earthly) and figurative (mathematical-astronomical) sense (RV, I.164.39,) and notwithstanding their attitude to Yāska, the main authority in the Vedic astrosemiotics, and Sāyaṇa, the main integral commentator of the Vedas, confine themselves to a formal linguistic analysis, detrimental to the integrated approach.

According to Bhartr̥hari, the outstanding representative of the philosophy of Sanskrit grammar, who lived, probably, in the seventh century, the Vedas are not created, nonperishable, are inherent in the substance or original cause of the universe, and are manifestation and a way of realization of Brahman, cosmic conscience.

The composers of Dharmaśāstras call the Vedas the unique śabda-brahma, that is ‘Verbalised Brahma’ or ‘Sonorous (Sounding, Speaking) Eternity,’ as the life span of Brahmā embraces the eternity itself. The Veda is declared eternal, indestructible and non-produced. Ancient celestial ṛṣis in days of yore discerned inaudible sound or word (śabdā, vac) thanks to their power of concentration (yoga-śakti,) that is why the Vedas are called śruti, the ‘Heard Word.’

To our view, this legend must mean that the Veda represents actually the product of a long empirical observation and codifies in its mantric package mathematical chronological laws.

The technique of retaining this vast literature compiled as the Vedas, which contains certain concepts with an exceedingly interesting science-potential in an almost incredibly meticulous form, as also the technique of interpretation of its songs with a host of formal sciences are the distinct pointers to the great practical value of the Veda.

The linguistic texts, though being philological in form, should, nevertheless, be considered worthy of being called exact science as well. To my mind, these texts are, presumably, auxiliaries of exact

stopwatch time reckoning through the Veda-recitation.

Phonetics as Phono-Chronometry and Ternary Code (Śikṣhā Vedāṅga)

As the tigress carries her cubs between two (rows of) teeth taking care lest they should either be dropped or bitten, so should one pronounce the (Vedic) speech-sounds lest they should be dropped (i.e. elided) or differentiated (i.e. mispronounced.)

Pāṇinīya-Śikṣā, 25.

The high level of the Vedic phonetics is certified both by special treatises and the Vedic mantras themselves kept in ‘conjoint reading’ (saṃhitā) according to the special rules of phonetic joining of words and in phonetic ‘per word reading’ variant (pādapāṭha.)

The ancient Indian doctrine about sounds of speech, their classification, place of articulation, rules of sound combinations and recitation fixed the Vedic texts in a constant form during millennia. It is a circumstantial proof of existence in the Vedas of the latent sense.

The science of phonetics is determined in textbooks as a doctrine about sound, intonation, length, accent, pause and junction of sounds. Besides, it includes scientific classification of sounds according to a place of articulation, pitch, correlation with musical notes, character of modifications and definition of tempo of the Vedic recitation.

In the Vedic meters, the quantity of syllables and their longitude are determining factors. The quantity of syllables is strictly established for all the Vedas. Therefore, the Ṛg-Veda, according to tradition, contains 432000, the Yajur-Veda 288000 ($\frac{2}{3}$ of the Ṛg-Veda) and the Sāma-Veda 144000 ($\frac{1}{3}$ of the Ṛg-Veda) the obvious and ‘latent’ syllables. The latent syllables contain in diphthongs, long vowels on joints of complex words, in some consonants, such as ‘v’ and ‘y.’ A part of syllables, probably, is ‘hidden’ in prosaic colophons and/or additional hymns or mantras common to different Saṃhitās.

Correct division into syllables of the Saṁhitā's conjoint text would be not possible without the advanced science of phonetics. Therefore, śikṣā has also the status of the vedāṅga (vital part of the Veda.)

It defines 64 sounds of Sanskrit (21 vowels, 25 consonants, 8 non-syllabic, sibilant and aspirants, 4 yāmas or stops, anusvāra or nasalization of a preceding vowel, visarga or hard aspiration, k, p and pluta or lengthened l.) Their scientific classification is made in accord with 8 and 3 places of articulation. The latter three places are correlated with three Vedic meters and three daily ceremonies. All sounds are divided into five groups depending on pitch (high, low and variable, and also nine modifications,) correlations of pitch with certain musical notes, length (short, long and lengthened or pluta of three 'measures,') and efforts (initial and subsequent.)

The Sūtra defines three tempos of the Vedic recitation: slow, average and fast.

It orders to read harmoniously, clearly uttering all words:

32. Those who recite the Veda in a singsong manner, (too) quickly, with a nodding of the head, use a written text at the time of recitation, do not know the meaning of passages read, and have a low voice, are six kinds of bad reciters.

33. Sweetness, clearness, separation of words, right accent, patience and ability to observe time are six merits in a reciter.

34. Shyness, fear, extreme loudness, indistinctness, undue nasalization, repressed tone, undue cerebralization, non-observance of the place of articulation (in general) and (proper) accent, harshness, creating undue separation between words, uneven tone, hastiness, want of due palatalization: these are the fourteen faults in the Vedic chant.

35. One should not recite a Vedic passage in under-tone, between one's teeth, quickly, haltingly, slowly, with a hoarse voice, in a singsong manner, with repressed voice, omitting (occasionally) words and syllables and in a plaintive voice.

36-37. In the morning, (the Vedic student) should read (mantras) with a voice from the chest, which should be (as deep-toned) as the growl of a tiger. In the midday he should read it with voice from his throat, which should be like that of a cakravaka. In the third savana (i.e. the evening offering,) he should recite it in the highest pitch from the roof of his mouth and his voice should be like that of a peacock, goose or cuckoo.

50. In the repetition of that which has come from a bad teacher, that which is indistinct (lit. burnt,) mispronounced, from a faulty text there is no deliverance from its demerit as from the snake-like sin.

51. But in repeating with good accent and voice (lit. mouth) that which has come from a good teacher, and is distinct, from the good text and is well established, the Veda shines.

51a. One ought not to repeat mantras with teeth shown, lips unduly protruded and with indistinct, unduly nasalized and half choked-up voice and immobile tongue.

52. A mantra uttered either with a defective accent or pronunciation is badly done and it does not carry the proper sense. And it is like a thunderbolt of speech and kills the yajamana just as 'Indra-śatruḥ' (having two opposite meanings with different pronunciation – 'the enemy of Indra' and 'the person whose enemy is Indra') did because of its wrong accent.

53. (When a mantra is) deficient in a syllable it tends to diminish life, and (when it is) lacking in proper accent it makes the reciter troubled with illness, and the syllable (wrongly treated) will strike one at the head as a thunderbolt.

54. If anybody reads (the Veda) without a show of hands and does not observe proper accents and places of articulation Ṛk, Yajus and Sāman burn him and (on death) he attains rebirth as an inferior animal.

55. And a person who reads the Veda with a show of hands, observes proper accent and places of articulation and knows the meaning of what he reads is purified by the Ṛk, Yajus and the Sāman

and is placed high in the realm of Brahman.’

These extraordinary rules, undoubtedly, were conditions not of an exotic embellishment – hardly the latter could become the reason of unprecedented penalties for changes of syllables, tone, etc. Most likely, the formidable rules protected functioning of certain digital codes, such as binary, ternary, chronometric, and some other analog and digital cryptograms.

Pratiśākhya, a special class of chronolinguistical commentaries to multiple recensions of the Vedas, which have come down to us in several variants, investigate different aspects of phonetics, metrics, grammar, textual criticism and rules of recitation in application to each Veda-Saṁhitā and its recensions.



11. GRAMMATICAL INTERPRETATION

Thus, the mastering of the word (śabda) is comprehension of supernature (paramātmān;) The connoisseur of its operation chares immortality of the (great) Brahma.

Bharṭṛhari, 'Vākya-Padīya,' 1.132.

Bharṭṛhari insists, as my former scientific guide Prof. I. D. Serebryakov used to emphasize, on that the first stage of comprehension of the Veda is not the blind faith, but the rigorous Sanskrit grammar, which was considered by him the basis of all sciences and imperial way leading to redemption from ignorance (Vākya-Padīya, Part I, 1 – 17.)⁵⁵

The Vedic texts are cryptic to such an extent that passages sometimes look like meaningless jumble of words, far from being corrupted or absurd, the fact strongly emphasized by Sāyaṇa in his introduction to the Ṛg-Veda. But mechanical application, which is common to all European experts in Sanskrit grammar, of the grammar to the Vedas is not sufficient. It is stunted of many things that are necessary for a successful decipherment of the Vedas as the narration in the saṁhitās plays a very negligible role.



William Jones

Sir William Jones (1746-1794) worked as the judge in Calcutta, then taught in Oxford as the first British scholar who mastered Sanskrit and studied the Vedas. He knew also Arabian and Persian. He translated some poems from Sanskrit, including Shakuntala of Kalidasa. In his speech in the Asian Society of Bengal, he declared that the European languages, Ancient Persian and Sanskrit belong to one family. That gave a push to development of comparative

⁵⁵ Bharṭṛhari, Vākya-padīya, Critical Text of Cantos I and II with English Translation, Summary of Ideas and Notes by K. Raghavan Pillai. In: Studies in the Vākya-padīya, Vol. I, Delhi, 1971.

philology.

He admired the Vedas. However, in historical views, he leaned on James Mill's concepts, the author of the 'History of India.' He described the Bhagavata-Purāṇa only as a 'narrative spoof,' and Bhāgavad-Gīta without any reason considered an imitation of the Christian Gospel.

Indological Squabble



Known German indologist and historian of Sanskrit literature Albrecht Weber (1825–1901) is sometimes characterized in India as racist, whose chauvinistic ideas were thinly twisted in works on Indian philosophy and culture.

Weber says also, as W. Jones, that the Mahābhārata and the Bhāgavad-Gīta reflected influence of Christian theology.

Two Sanskritists, Franz Lorinzer and E. Woshborn Hopkin, at once supported Weber's speculations. In 1869, Franz Lorinzer issued a new translation and comments to the Bhāgavad-Gīta in German, believing that it actually was a reflection of the New Testament. However, his theory was rejected as ridiculous by the majority of scholars.

Weber and his colleagues Otto Bötlingsk, the native of Petersburg (1815-1904,) who later moved to Jena, together with Albrecht Weber, Ernest Kuhn and Rudolf von Rot (1821-95,) disciple of French scholar Eugene Bürnouf and the initiator of Vedic Studies in Germany, edited well-known seven-volume Petersburg Sanskrit-German Dictionary.'

However, T. Goldshtüker (1821-1872), the native of Germany, who taught Sanskrit at London University College, wrote a book about Pāṇini and edited the 'Great Commentary' of Pātāñjali, criticized sharply their work. He insisted on that the dictionary abounded in mistakes and was based on speculative and wrong philological

principles.

Weber was so indignant at T. Goldshtüker's criticism that threw at him with insults, having declared that his criticism indicates perfect disorder of his mental faculties.

Goldshtüker called in question 'learning' of Rot, Bötlingk, Weber and Kuhn: 'My duty is to point out directly that doctor Bötlingk is unable to understand even easy rules of Pāṇini (it is necessary to notice, that Bötlingk edited Grammar of Pāṇini – M. M.,) especially, those of Kātyāyana not speaking about their application to understanding of classical texts. Mistakes in his part of the Dictionary are so numerous that it should disturb any serious Sanskritist, who is capable to see harmful influence, which they should have on studies of Sanskrit philology.'

He further has noticed, that questions, 'which should be solved with utmost discretion and which could not be solved without very toilsome researches, were expounded in the Dictionary in the most unpersuasive form... When I see that the most outstanding Hindu scholars and authorities – the most valuable and sometimes unique source of all our knowledge about ancient India – are despised in theory, crippled in print, and, as consequence, are withdrawn from interpretation of the Vedic texts...; when a clique of Sanskritists talks profusely about the sense of the Vedas, which existed at the beginning of Hindu civilization...; when I see, that words of these Sanskritists, obviously, get weight and influence from posts occupied by them...; I understand that indulgence to this wild revelry of Sanskrit philology would be an attribute of cowardice and infringement of the duty.'

However, squabble of Goldshtüker with his colleagues was simply an academic conflict. Goldshtüker composed an 'Indian Biographic Dictionary,' but he also did not understand anything in the Indian national character. He considered Indians burdened with the Vedic religion, which had brought them only contempt and sneers all over the world. Therefore, he suggested the same remedies as M. Müller – to reeducate them on European manner, to accustom

Hindus to the Western values and to teach them to look at their culture through the eyes of Western indologists: ‘Means to destroy the enemy is so simple as well as invincible – to open properly the eyes to young generation on its ancient literature.’

In the book ‘Sacred Scriptures of Hinduism,’ Goldshtüker threw with criticism at the Vedas trying to show to new Indian generation that their Holy Scripture is scientifically discredited by his feather and that they inevitably should accept the European values and improve their character.

Sanskrit as Artificial Programming Language

Sanskrit is a ‘harmonious, closed, secret,’ ‘skillfully made,’ ‘accomplished or perfect’ classical, sacred and literary language of Vedic India. It belongs to Indo-Iranian group of Indo-European families of languages. It is the brightest representative of the satem sub-family (alongside with Albanian, Armenian, Lithuanian, Iranian and Slavic languages which have the greatest similarity in grammatical system, dictionary structure and pronunciation – these languages are supplemented with Centum sub-family including Greek, Latin, Roman, German and Celtic.) Families are named according to characteristic differences in pronunciation of the word ‘hundred.’

Sanskrit is the language of the Vedic calendar-astronomical ceremonial church chanting (partly, the language of Jain and Buddhist ethical-astral-chronometric canons,) the ‘language of the devas or planets’ (deva-bhāṣa,) otherwise, scientifically designed on the basis of Indo-European parent tongue (10 – 8 thousand years ago) the poetic and scientific language, which became in the subsequent millennia the basic instrument of a stunning in volume Vedic and Brahmanical scientific literature.

From the beginning of the Christian era Sanskrit was supported as a literary language of priests, the scientific and educated castes of India, and it has maintained this position until now. Until today, any

language of the world has no grammar constructed so precisely, as the Sanskrit grammar of Pāṇini written in the laconic algebraic form.

The classical Sanskrit has certain differences from the ancient form of the Indian speech kept in the Vedic sacred texts, the Brāhmaṇas and the Upaniṣadas. The Vedic Sanskrit, though based on national idioms and considered much more ancient, than the classical Sanskrit, however, similarly to the classical Sanskrit, is also artificial 'high language.' The Vedic Sanskrit and the classical Sanskrit are literary forms of ancient Indo-European speech, which existed in many nonliterate national dialects. Some of these ancient dialects had developed into Prakrits or middle Indo-Aryan languages (most known of which is Pali.)

The Vedic differs from the classical Sanskrit in the same way as the Greek of Homer differs from the classical Greek. The Vedic Sanskrit was richer and less ordered, than the classical language, which lost much of early grammar. The Vedic subjunctive mood was lost and quantity of the Vedic infinitives was reduced from a dozen up to one. The classical Sanskrit lost the Vedic system of pronunciation and accent, which was still in full force in the days of Pāṇini.

Despite of these losses, Sanskrit remains a complex language with rich inflection, alternation of vowels and contextually dependent change of sounds. It has three genders and three numbers. Sanskrit, as a whole, better, than any another Indo-European language, except for, probably, ancient Greek and Church Slav, has kept linguistic features of the Indo-European speech.

The remark of a Kashmirian Sanskrit poet Bilhaṇa that in Kashmir, even women understood Sanskrit speaks about its wide circulation in early Mediaeval India.

The status of Sanskrit in modern India rises invariably. If ten years ago it was named vernacular by only 200000 persons, nowadays already about 2 millions pretend to speak it. Magazines, plays, films (some from them are awarded with high prizes,) daily news, poems use Sanskrit. For example, from 1947 till 1997, over fifty epic poems

were composed in Sanskrit. Among them there are a lot of works on modern issues – poems devoted to L. N. Tolstoy, M. L. King, J. Kennedy, V. I. Lenin, description of the XXth century, of the way of India to independence, global problems, star wars, painful points of our planet, such as Namibia, Kashmir, Punjab, Shri Lanka, etc.) Classics of the world literature (V. Shakespeare, L. N. Tolstoy, M. K. Gandhi) are translated into Sanskrit.

Scientists, linguists, programmers, indologists and, especially, Sanskritists unanimously assert that Sanskrit has features and advantages, which are absent in all other ordinary languages. Moreover, the experts of NASA preoccupied with a problem of training computer to understand ordinary languages come to a conclusion that the most exact phonetically and grammatically, and, hence, the most laconic one appears to be Sanskrit.

English is not exact not only phonetically, but also grammatically. The same form of a word can be a noun in the role of a subject, an attribute or object, and a verb in the role of a predicate. It means that entering into a computer such a word necessitates the use of additional words-quantifiers indicating the part of speech and syntactic links, while in Sanskrit (and in related to it synthetic languages, such as Russian) accuracy and laconism are present initially and organically. Many scientists are inclined to consider Sanskrit most ancient of languages of the planet, which preserved the initial purity and correctness due to the unique codification in a series of special linguistic Vedic disciplines. The phonetics and grammar of Sanskrit remain exemplary. The dictionary of Sanskrit is huge, productive in sense of the neologisms necessary for science and has unusual riches of synonyms, meanings and shades.

Thus, all Sanskrit words are deduced from their own roots. That specifies Sanskrit as a language-ancestor in relation to all Indo-European family, in which this feature is enough destroyed.

Nowadays, scientifically described manuscript heritage in Sanskrit totals more than one million scientific, philosophical and artistic

compositions (as much, presumably, is not reflected yet in catalogues of manuscripts.) A century ago, it was more than the totality of the other world literature taken together! The Sanskrit literature, since the Vedic times, covers all disciplines of the philosophical, scientific, linguistic and applied cycles. All its disciples have strictly scientific terminology, analytics and systematization, metatheory and methodology. Therefore, expression of the Mahābhārata that it reflected all phenomena of the universe has quite good sense. However, many ancient meanings are not always easily found out: they are frequently latent behind a dense veil of foggy expressions, extravagant terminology, complex metaphors, mythologems, rearrangements of parts of the Vedic text or substitutions of figures instead of syllables or vice versa.

The Programming Language in Computer Science

The programming language is any artificial language, which can be used to determine a sequence of instructions (commands) which can be processed and executed by a computer. Translation from the initial code expressed by the programming language into a machine code with which the computer needs to work should be automated by means of other program called the compiler; thus, English and other natural languages have originally been excluded.

There is a set of types of the programming languages developed the last years. Originally, programmers should write down instructions (commands) in a computer language. This coded language, which can be understood and be carried out directly by a computer without transformation or translation, will consist of the binary figures representing codes of operations and address of memory. As it will consist of sequences 1 and 0, the computer language is difficult for use.

The Assembler Language was developed for the greater convenience. It allowed to express instructions (commands) with the help of

alphabetic symbols (for ex., AD for English ‘add’ ‘to add’ and SUB for ‘subtract,’ to subtract.) Though assembly language with the mnemonic code is easier to use, than a computer language, undoubtedly, it was desirable to develop programming languages more similar to human. The first so-called high-level language was FORTRAN (an acronym for Formula Translation, ‘translation of formulas,’) developed in 1956. FORTRAN well suited scientists and mathematicians, as it was similar to mathematical records. Then in 1960, more practical language COBOL (Common Business-Oriented, ‘focused on usual activity’) appeared. COBOL applies words and syntax, having similarity to usual English language. Later, other languages, even easier for studying and use began to be created. Such language as BASIC (Beginner’s All-Purpose Symbolic Instruction Code,) for example, can be easily mastered and can widely be used by the nonspecialist at schools, at enterprises and at homes for programming on a desktop computer. ‘C’ is high-level language, which can function as assembly language. The significant amount of the commercial software is written in it. Other such versatile widely used language is Pascal (named in honor of the French scientist-philosopher Blaise Pascal.)

Later some structures of English have started to be used and understood by some languages of the fourth generation. High-level programming languages have those or other exclusive features, which make each of them suitable for the specific application. Languages of the fourth generation (4GLs) are closer to human language, than high-level languages (or languages of the third generation.) They are used more often for work and management of databases or as languages of inquiry; for example, FOCUS, SQL (Structured Query Language) and dBASE. Object-oriented programming languages, as for example, C++ and Small-talk, make programs from ready-made structures of the data or computing instructions (commands) named ‘objects.’ New programs can be made by way of selecting and manipulation with objects. Now, there are the languages understanding the instructions in English.

Vedic Linguistical Analytics (Vyākaraṇa-Vedāṅga)

Pāṇini's grammar has been evaluated from various points of view. After all these different evaluations, I think that the grammar merits asserting... that it is one of the greatest monuments of human intelligence.

Cardona

Codification of the Sanskrit grammar took place, as it is generally believed, in the middle of the first millennium B.C.E. in the work Aṣṭādhyāyī by a symbolical author called Pāṇini. Obviously, it was preceded by a long philological-analytical period, the beginnings of which are lost in the remote past. There are ten scholars mentioned by Pāṇini, who, presumably, had contributed to the study of Sanskrit grammar.

It is also clear that the general concept of this outstanding grammar had been developed earlier to the composition of the Ṛg-Veda, which is the product, in particular, of a very intensive grammatical analysis. For example, the very first hymn of the Ṛg-Veda contains declension of the word 'Agni.'

Aṣṭādhyāyī or the 'Analytics of the Vedic speech in eight books' consisting of 4000 brief algebraic formulae codified 1700 elements of phonetics and grammar of the Vedic Sanskrit. It is called quite often the 'Veda of the Veda,' 'science of the Science' for without it neither creation of the Vedas nor understanding of direct and, especially, latent meaning is possible.

It consists of eight chapters, each subdivided into four chapters. In this work, Pāṇini distinguishes between the language of sacred texts and the usual language of communication.

He codified virtually the whole structure of the Sanskrit language, which has hardly changed.

This book was commented by Kātyāyana and Pātāñjali. Ancient Indian philologists-exegetes had demonstrated a scientific potential quite comparable to the achievements of structural linguistics and covered the problem field of many disciplines of the European sci-

ence of many epochs.⁵⁶

Pāṇini received the nucleus of the algebraic analytics of the Sanskrit language in the form of the phonetic alphabet of Sanskrit from Śiva, the Moon.

Not occasionally, ‘Aṣṭakaṃ,’ the name of the grammar of Pāṇini, is not only reminiscent of the name of one of the Rigvedic ṛṣis, who composed several hymns, and of a ‘person, who scrutinised the eight books of Pāṇini’ (aṣṭakaḥ,) but also alludes to the ‘eighth day of the synodical month (aṣṭakā.)’

The Sanskrit analytics, unexpectedly, shows its similarity with the modern programming languages.

The structure of Saṁskṛt as a programming language is discussed and compared to modern computer languages by T. R. N. Rao in an article entitled ‘The Pāṇini-Backus Form in Syntax of Formal Languages.’⁵⁷ According to T. R. N. Rao, Pāṇini invented a notation to describe the rules of grammar, which are remarkably similar to that devised by Backus for description of grammars and determining of syntax of the programming languages. The Backus Normal Form was discovered independently by John Backus in 1959.

Pāṇini used a notation precisely as powerful as the Backus normal form, an algebraic notation used in Computer Science to represent numerical and other patterns by letters. Scholars emphasize that the construction of sentences, compound nouns etc. was explained by Pāṇini as ordered rules operating on underlying fundamental structures. It is similar to the fundamental notion of using terminals, non-terminals and production rules of modern day Computer Science.

⁵⁶ V. K. Shohin, : Brahmanistskaja filosofija: Načalnyj i ranneklassičeskij period (Brahmanic Philosophy: Initial and Early Classical Period). Moscow, 1994. Pp. 129–131.

⁵⁷ Computing Science in Ancient India, ed. by T. R. N. Rao and Subhash Kak, Published by Center for Advanced Computer Studies, University of Southwestern Louisiana, 1998.

S. Kak rightly says that ‘this article makes the powerful case for renaming Backus-Naur Form to Pāṇini-Backus Form, as we must give credit where credit is due.’

Therefore, Pāṇini should be thought of as the forerunner of the modern formal language theory used to specify computer languages.

Pāṇini was the first to come up with the idea of using letters of the alphabet to represent numbers.

Ananda V. Raman in an article published in ‘Computing Science in Ancient India’ discloses the similarity of an ancient Sanskrit method of the Katapayadi Scheme to modern hashing techniques used in programming.

An additional argument proving Pāṇini’s involvement in programming comes from a myth about his relationship with Piṅgala, the author of the Chandaḥ-Śāstra.

From this perspective, S. Kak assumes that Sanskrit grammar ‘represents a universal computing system and anticipates the logical framework of modern computers.’

Frits Stahl supports the view that the grammar of Pāṇini represents a universal grammatical and computing system.

These observations indirectly confirm my main thesis that the Vedic grammar was elaborated by mathematicians for a special purpose of translating the machine binary or ternary codes into an ordinary vernacular. Moreover, mantras were organized in hymns and marked with precise authorship (year) and tutelary god-addressee (month.) It permitted to manipulate blocks of binary or ternary numbers (hymns and chapters) as objects according to the chosen planet and its cycle. This way Sanskrit became a high level programming language operating with a machine code through a poetic mantras and hymns. Therefore, the Sanskrit grammar holds the clue to translation of a program of digital code into ordinary poetic language making processing of large binary numbers as easy and pleasant as a small talk or singing songs.

The Paninian Grammar helped building the binary code into a vernacular language and to discern logical bits in the binary code.

Due to the efforts of the translators of the Vedas into modern vernaculars, a word-per-word paraphrase of the R̥g-Veda was done, similarly to all samples of translatores, jam-packed with literalisms and gobbledegook. However, the stupendous endeavors in the area of the Vedic phonology, grammar and stylistics and full translation of the R̥g-Veda allow mastering their archaic language and style.



Churning of the Ocean
by devas and asuras

12. SEMIOTIC-ETYMOLOGICAL INTERPRETATION

Really, the title itself of the Vedas indicates their connection with science. During two centuries, they have been arresting attention of scholars of many countries, though, until now, they have reliably hid their secrets.

A certain respectful attitude to the Vedas as sacred scripture prevail among believers and scholars. However, those who are acquainted with them closer catch also some latent meaning and start to guess the scientific content in them. The logic of investigations and experiments leads insistently some scholars to a deeper and more adequate understanding of the secret scientific meaning of the Vedas and recognition of the special code in the Vedic texts.

Symbolical character and necessity of scientific decoding of the ancient Indian cultural heritage is felt more keenly and realized more pointedly. Process of reconsideration is stimulated from within, by the logic of the Vedic texts, and from outside, discovery of the Proto-Indian civilization with a unified writing system, parallel researches of other ancient civilizations together with successes of computer science.

Dayananda Sarasvati and his followers go so far as to proclaim the Vedas to be not only the depositories of ancient wisdom but also the source books of modern science and saw in the Vedic Gods the vague symbols of astronomy, physics, chemistry and so forth.⁵⁸

‘Vedic Symbolism’ of Prof. S. P. Singh, a seasoned Vedic scholar, trying to provide a befitting answer to all misrepresentations of the Vedas, seems also to be centered in unlocking the secret of the Vedas from the standpoint of stylistics. The author also emphasizes the enigmatic nature of the text, which characterizes itself as secret words (*niṅyā vacāmsi.*) He says that the Veda remains rather blurred

⁵⁸ Dh. D. Mehta, *Positive sciences in the Vedas*, New Delhi, 1974.

by the misinterpretations of the typical modern scholarship in the area. Moreover, he thinks that it contains the wisdom of ancient seers and sages supposed to have seen across the total span of the reality and who had got so elevated in their consciousness as to think of the whole world as a nest (*yatra viśvam bhavaty ekanīḍam,*) and of all expositions of truth as referent to one and the same Reality (*ekam sad viprā bahudhā vadanti.*) His main purpose, evidently, is to prove that the Veda can provide suitable ethical answer to the basic problems of humankind, that is peace, harmony and satisfaction in life.⁵⁹

Recent rather interesting publication of a known Russian Indologist P. A. Grintser of the Russian State Humanitarian University (Moscow) entitled ‘A Secret Language of the Ṛgveda’ has presented a lot of evidences of the existence of a special code and secret expressions (*niṅyā vacāmsi,*) not clear to uninitiated, but which the composers were fully aware of! Limiting his method to stylistics, this scholar has come to conclusion that this secret tongue represented simply a set of stylistic techniques and metaphors, described later in dozens of treatises on Sanskrit poetics.⁶⁰

Nevertheless, P. A. Grintser’s approach, in my opinion, is only an approximation and does not bridge the interpretation gap between the true secret language of the Vedas and our understanding. It is rather probable that the Vedas really have certain latent scientific level of meaning or, more likely, meanings, escaping even the most careful stylistic-grammatical analysis!

In this connection, it is necessary to note also that this poetics assumes extremely advanced semiotics and plurality of levels of understanding and interpretation. P. A. Grintser is aware of a category of Sanskrit poems read in different directions and having two-three, sometimes even seven various contextual meanings.

⁵⁹ S. P. Singh, *Vedic Symbolism*, New Delhi, 2001.

⁶⁰ Pavel Grintser, *Tajnyj jazyk Rig-vedy (Secret Language of the Rig-Veda)*, Moscow, 1998. (In Russian.)

One Sanskrit poem is made of words, each having hundred meanings. If to assume that average verse consists of ten words, it has not less than 10^{20} contextual shades of meaning! If only 50 such words were used in all the poem, the total number of all combinations of meanings would be estimated as Googol – 10^{100} . The number Googol 10^{30} times surpasses the quantity of elementary particles in the Big Universe known to modern astrophysicists! Hundred stanzas of the poem create the unimaginable maximum of 10^{2000} or Googol to the twentieth power combinations of meanings. It looks like a premeditated way of formulation of the philosophical principle of general interrelation, doesn't it?

Take into account, that such poems are not exceptions, but natural phenomenon in Sanskrit literature, in which polysemy is present at many levels: mythological, philosophical, literary, mathematical etc.

Philologist San Sarin at the XIth World Sanskrit conference in Turin has noted that numbers, multiples of 18 and 108, lay in the basis of the ordinance of the Mahābhārata, its quantities of military divisions and the very names of the epic characters.⁶¹

The paper of San Sarin has pushed me to reconsider the quantitative data concerning armies of the pāṇḍavas and the kauravas in the light of the calendar theory. The brief analysis of the chronometric organization of the 'armies' in the Mahābhārata and the Bhāgavad-Gīta in a calendar-chronometric application is given in the Part II.

A Belgian scholar Conrad Elst argues that the character of the Vedic mythological-scientific terminology can seem insufficiently transparent for the modern reader who has got used to 'exact' special technical terminology in questions of astronomical dating and so on. Then, the modern reader should recognize that technical terminology in Vedic times, mainly, consisted of the accepted metaphorical expres-

⁶¹ San Sarin, 'Mahābhārata: The numbers 18 and 108 through akṣauhiṇī.' In: Proceedings of the XIth World Sanskrit Conference. Turin, Italy (in progress).

sions based on usual concepts. It was not absolutely so primitive, as the same method is used in the modern science if to analyze etymology of modern technical terms such as, for example, a telescope – from Greek ‘far-sight,’ oxygen – ‘axid-gen,’ cylinder – ‘a roll.’ Unique distinction consists in that we use the dictionary of foreign classic languages for creation of terms, while Sanskrit scoops specialized terminology from itself.

K. Elst also has understood that as exact astronomical data were really registered since the 5th millennium B.C.E. and were kept during more than two thousand years, this unprecedented feat of oral tradition testifies to the existence of literacy and writing or, at least, of mnemonic device capable to keep orally the information, such as the verse. Thus, the poems equipped with mnemonic devices like verse, rhythm and tone, should be composed, when the information was accessible directly, that is close to the time of actual observation, and these poems, certainly, should be the Vedic hymns. Otherwise, it is necessary to postulate that the Vedic hymns had been made by borrowing the content of an earlier poetic tradition, (identical to the Vedic one,) what, certainly, is absurd.

All these scholars affirm on the basis of the reinterpreted mythological imagery that the Hindu scriptures are full of scientific information in a coded form. It is true that nothing in the Vedas means what it seems to mean. Being skeptical about some romantic notes not justified for the time being by rigorous logic and data, we should not indiscriminately reject all of them. Instead, we should analyze critically the hypothesis of the secret programmed language.

These scholars think that this secret tongue represented simply a set of stylistic techniques, described later in dozens of treatises on Sanskrit poetics.⁶²

The Vedic secret language cannot be, I am sure, reduced to stylistics, poetics and mythological imagery. To my mind, spiritual or

⁶² Grinzer P. Tajnyj jazyk Rg-vedy (Secret Language of the Rig-Veda), Moskwa, 1998. (In Russian.)

moral dilemmas widely used in astronomical-calendrical myths are sublimations of patterns of human behavior applied to movements of planets in order to blueprint their complicated configurations otherwise very difficult to comprehend. They should be regarded as metaphors, stylistic or poetic contrivances or special mythocode developed for easier remembering of large numbers.

I share Russian literary critic K. Kedrov's belief according to which the way to the future global civilization has run today not only through the further perfection of electronic news media, computerization, synergetics, new sociology of culture, ecological ethics and global education, but also through laborious decoding of astronomical and cultural metacode of the ancient Indo-European civilization, its unique mythological-metaphorical language and reconstruction of its spiritual matrix.

As K. Kedrov writes, 'works of culturologists of the XXth century have opened cosmogonical aspect of any ancient mythology...'; 'the star crystal lattice frame or, to tell more correctly, matrix, is printed in depth of the most ancient literary plots...'; 'a composition of the star sky, its spatiotemporal existential arrangement, alternation of planets, stars and constellations, certainly, influenced significantly the artistic nature of the ancient folklore, and through folklore, all world literature.'⁶³

Difficulty of correct perusal of the religious-philosophical and mythological-astronomical metaphors consists in that this 'matrix' had strictly concrete astronomical-mathematical meaning now lost. For its successful decoding, we have to find a natural interweave of paleoastronomical, astronomical-archeological, mythological, astronomical-folkloric and astronomical-literary studies leaning on historical-cultural, historical-philosophical and historical-linguistic comparative studies.

In other words, organic merge of history of astronomy and natural sciences as a whole with a history of language, literature and

⁶³ K. A. Kedrov, *Poetic Cosmos*, Moscow, 1989. Pp. 43, 44, 47. (In Russian.)

philosophy is necessary for crossing the threshold of the parental 'house' of the ancient Vedic civilization, from which we temporarily ran out having grasped only the most necessary and most simple things. Now, I can say in sad and sober truth that the reconstruction of an originally civilized global commonwealth of peoples with that 'fragile' inheritance, which we have taken out from the past, which had collapsed in severe cataclysms, is possible only in declarations, but not in practice!

All classical Sanskrit literature follows the pattern of the Vedic astral-calendar mythology. Even works not belonging to the category of 'sacred scriptures,' that is, astronomical-mythological poems as, for example, lyrical poems of Kālidāsa and satirical and didactic poems of Kṣemendra, are up to such a degree sated with images from mythology that the content of love lyrics, social statements and character of irony remain completely unclear to the reader, if he is insufficiently familiar with the richest Sanskrit mythology. A polysemy of implied sense of Sanskrit classical poems is not a modernization, but the essence of Sanskrit!

To grasp the spirit of the ancient Vedic civilization without clear understanding of this feature of its language and thinking is to be confronted by one danger, namely, that of destruction of our surprisingly thin spiritual heritage, our original history, our cultural 'roots.' That, undoubtedly, deprives us of an opportunity of adequate perusal of the monuments of the Vedic literature, and our life loses correct human perspective.

I recur not once to comparisons of Indian astral-mythological tradition with Slavic astrofolkloristic material, but constantly having in mind that the close relationship of these two branches of the Indo-European culture, nevertheless, is blocked frequently by a set of variations and a difference of levels of their scientific generalization. The stability of folkloric situations ostensibly leaning on a 'stability of mobile outline of the star sky, where the same events take place every year before the eyes of different peoples' certainly, is decep-

tive.⁶⁴ The ancient observational astronomy conceptually as also functionally was enough diversified depending on national background (Vedic, Sumerian, Egyptian, Chinese, Arabian, Jewish, Greek, Roman, Indian-American, Slavic, German, Turkic, etc.) The conformity between distant traditions of ancient calendar concerns only general pattern but not their metalanguage and specific principles.

The identity between ancient Slavic calendar signs and Vedic lingual-mathematical-calendar script had not been perceptible until I deciphered the latter one.

Astro-Mytho-Etymology (Nirukta-Vedāṅga)

The Vedic semiotics and etymology (nirukta) was codified by the school of Yāska. It is an astronomical semiotics of the Vedic mythological names. It interprets symbolically the names of the Vedic gods, difficult Vedic words, their variations and expressions as metaphors and allegories of the celestial phenomena. This feature is characteristic of the antique euhemerism (method of interpreting myths,) Byzantine theology and European mythological school of the XIXth century. Yāska substantiated the need for composing the full commentary to all the Vedas and a dictionary of important Vedic terms.

Nirukta, which is the most ancient work of the ramified Sanskrit lexicography, inspired several hundreds of explanatory and encyclopaedic dictionaries specialised in different branches of knowledge as well as dictionaries of synonyms, homonyms and analogies.⁶⁵

Our integrated chronometric hermeneutics and logical approach to the latent content of the Vedas has been deeply influenced by the etymological ideas of pūrva-yajnikas (‘first astronomers-ritualists’)

⁶⁴ K. Kedrov, *Opp. Cit.*, p. 39.

⁶⁵ Patkar, Madhukar M.: *History of Sanskrit Lexicography*. New Delhi, 1981.

and *nairuktas* (astroetymologists.)

Nirukta explaining astroterminology gives us a clue to mythological encryptions in the linguistic layer of the Vedic text. Nirukta must be further enhanced with the study of other Sanskrit dictionaries of special terms. Sanskrit contains many polysemous words containing clues to most important Vedic astronomical concepts. I am sure that this encrypted astronomical information coincides perfectly well with the hidden binary and ternary information of the corresponding mantras. The scrupulous study of these coincidences will serve as proof test of the restoration of exact computing procedures of the Vedic recitation based on kalpa ritualistic science.

Nirukta has preserved principles of Vedic cryptography. Western indology having absolutized them as principles of etymology resulted in mystical interpretation and consecutive mystification of the Vedic science.

Cryptography

A history of codes and code breakers from the time of the Egyptians to the end of World War II is described in greater detail by David Kahn,⁶⁶ Simon Singh⁶⁷ and many others. Such books won't teach you anything about how cryptography is done, but they have been the inspiration of the whole modern generation of cryptographers. Those books show how the human need for privacy has manifested itself through cryptography.

The cryptography was originally developed for a long time as means of concealment of written messages from extraneous eyes. Today its principles are applied to enciphering facsimile and

⁶⁶ David Kahn, *The Codebreakers: The Story of Secret Writing*, Simon & Schuster Trade, 1996, (first edition 1967.)

⁶⁷ Simon Singh, *The Code Book: The Evolution of Secrecy from Ancient Egypt to Quantum Cryptography*, Doubleday & Company, Inc., 2000.

television satellite signals and to protect data transmission between computers.

Transformation of a clear message (an open text) to the coded message (the code or the ciphered text) usually demands use of an algorithm (an established procedure) and a key. The algorithm can be well known, but some or all key information should be kept in secret from everybody, except for the transmitter of the message and the lawful addressee.

Many various systems of enciphering have been developed within centuries. In general, two basic mathematical operations, rearrangement and substitution or a combination of both are inherent in all of them. Rearrangement reconstructs elements of the open text, not changing elements. Substitution includes replacement of elements of the open text, as, for example, letters or pairs of letters with other symbols, not changing sequence, in which they are located. In more complex systems, rearrangements and substitutions go in cascades. Very complex and widely used variant of such a cryptic system is the Data Encoding Standard (DES,) which was developed in the middle of 1970 in the United States. It is a block code, in which 16 circles of substitution and rearrangements alternate. It ciphers 64-bit blocks of the open text coded by a binary code under the control of a 56-bit key. Cryptosystems can be symmetric or asymmetrical. In symmetric system, enciphering and decoding are carried out with the help of the same key; in asymmetrical system, two various keys are used.

Taking into account failures of several generations of ‘decoders’ of the Vedas, and sacred character of the calendar-chronometric knowledge, it seems necessary to assume presence in the Vedic texts of cryptography, special symbolical language and programming.

The Vedic Hypertext and Chronopoetics

As from the lit fire fed with damp fuel, various jets of smoke take off, exactly the same way, my dear, the Ṛg-Veda, the Yajur-Veda, the Sāma-Veda, the Atharva-veda, the Itihāsas, the Purāṇas, the Vidyās (sciences,) the Upaniṣadas, the Ślokas (verses,) the Sūtras (laws,) the Vyakhyānas (statements,) the Anuvyakhyānas (epilogues) proceed outside with breath of this Great Being.

*Brhad-Āraṇyaka -Upaniṣada, 11.4.10.
The Vedas should be supplemented with the Itihāsas and the Purāṇas; the Veda is afraid of little knowledge – relieve me of it!*

*Sāyaṇa, Foreword to the Ṛg-Veda;
Mahābhārata, 1.1.267.*

All the Vedic and Purāṇic literature is ‘divided’ (‘vyāsa’) or coordinated by symbolical author Vyāsa (‘Diameter’) with division of the zodiac into degrees and with the planetary periods. First, he divided a uniform Veda into the four collections of mantras devoted to certain planets.

The Atharva-Veda (consisting of 20 books, 5977 mantras,) created by Aṅgīrasa (the Moon) and Atharvan (possibly, Mercury) called the ‘priest’ of Agni (the Moon or the Sun,) was recited by brahmana priest and was devoted to Śaśija (‘the Offspring of the Hare or Moon,’ that is, Mercury).

The Ṛg-Veda (consisting of 10 maṇḍalas, 10622 mantras, 432000 syllables,) composed by Agni-Bṛhaspati or Gaṇapati called also Indra and Śiva, that is, the Moon or Jupiter, and executed by hotṛ priest was devoted to Agni-Indra-Soma (the Moon) and Bṛhaspati, Jupiter.

The Yajur-Veda (consisting of 1984 mantras and 288000 syllables generated by Sūrya (the Sun, the father of Saturn,) Vāyu, Antarikṣa and Yama (Saturn,) propagated by Yajñavalkya Vajasaneya

(embodiment of Viṣṇu, that is Saturn,) was performed by adhvaryu priest and was devoted to Bhauma, Mars.

The Sāma-Veda (consisting of 1875 mantras) composed also by Sūrya (the Full Moon or the Sun) was executed by udgaṭṭ priest and devoted to Bhṛgu, Venus.

From this analysis of authorship of the Vedas and their dedications, it becomes clear that the four collections were correlated with all the basic planets. Symbolical authors and addressees are interconnected according to mythological genealogies of the gods: the Moon (the father of Mercury) makes dedication to Mercury; Sūrya (the father of Saturn) transfers knowledge to Viṣṇu (sidereal Saturn.)

Besides, the Vedas are attached to certain cardinal points. So, the Mahābhārata says that the Yajur-Veda was read by Sūrya to Yajñavalkya in the Eastern side (during the full moon.) It is also connected with Yama (Saturn) and, evidently, with the Southern side, where Sūrya (the Full Moon) loses the force (the third quarter.) Other Vedas are also correlated by tradition with different cardinal points. These conformities established by the Vedic texts themselves give us reasons to relate the four Vedas to the new moon, the first quarter, the full moon and the last quarter of synodical month and to four seasons.

Most likely, it is not casual that the Yajur-Veda connected with the Southern side and waning Moon and the Atharva-Veda connected with the new Moon, the 'death' of the Moon and a starlit night, contain the full lists of lunar constellations. Not casually, the Atharva-Veda is devoted to Mercury. As it is known, this planet is close to the Sun and for a long time stays in conjunction with it. The Atharva-Veda is sometimes excluded from the list of the Four Vedas being most 'dark,' but sometimes is proclaimed the main and the first.

It is curious that the second name of the Atharva-Veda is the Brahmā-Veda (so was the name of the one of the nine śākhās, editions, nowadays lost.) The name implies that it was the Veda of the main priest, brahmana, and consequently, the main or the first Veda,

performed at time when Brahmā created primary ‘waters’ (heavens) of new month, year and year cycle. ‘Nabhasa’ means ‘heavens,’ ‘heavenly light’ and also ‘water’ and ‘ocean.’) Not without reason its unique ‘gr̥hya-sūtra’ (instructions for ‘domestic’ or new moon ceremonies) is attributed to Kauśika, that is, Viśvamitra, who symbolizes new Moon period and growing Moon.

All hymns of the Atharva-Veda are intended for domestic ceremonies. The hymns ‘aṅgirasas’ are characterized as ‘malicious,’ ‘harming’ or attracting ‘women’ (moonless Nights.) The hymns ‘atharvanas’ are considered as benign spells intended for doctoring devas, first of all, Agni, whose attendant is the ‘priest’ Atharvan. Hymns of the other Vedas were intended for performance in solemn ceremonies. According to the tradition reflected in the Atharva-Veda, the other Vedas developed from the Brahmā-Veda.

The Sāma-Veda, the Yajur-Veda and the Ṛg-Veda are correlated to three quarters of the bright part of synodical month.

The Sāma-Veda represents an original quintessence of the Ṛg-Veda having 1457 mantras in common, as though the culmination of a certain holiday of light, for example, of the Full Moon.

About a quarter of the Yajur-Veda (481 mantras) is common with the Ṛg-Veda.

The Atharva-Veda differs from the Ṛg-Veda more than all others, though, however, it also contains some common hymns (some songs of its first 19 books and almost all songs of the last, 20th book.)

Planets Jupiter and Venus, to which the Ṛg-Veda and the Yajur-Veda are devoted accordingly, are the brightest of planets, if to exclude the Sun and the Moon. Jupiter is the instructor of the devas, celestials, identified with growing phases of the Moon, and Venus is called the instructor of the asuras, opponents of the devas, identified, most likely, with waning phases. Both Jupiter and Venus are important for calculations of year cycles measured in synodical months. The 12-year and 60-year periods of Jupiter are more exact, than the 8-year period of Venus, whence, obviously, the higher sanctity of Jupiter

results. The Ṛg-Veda ‘filled’ with light of growing moon’s phases and coordinated with the periods of Jupiter (Bṛhaspati, Brahmā) is surrounded with the highest sanctity.

The Sāma-Veda correlated to the full moon and Venus is most brilliant and is set to music.

All sacred texts are organized around calendar numbers. 108 Upaniṣadas and 108 Tantras are grouped around 9 ‘planets’ placed in 12 signs of the zodiac or 108 padas (year ‘steps’) of the Sun.

The number 18 underlying partitioning of such compositions as the Mahābhārata, the Purāṇas, the Rudra-Tantras, etc., can concern 18-year or three-year cycle of eclipses (36 Months = 18 ṛtus, seasons of two months each.)

Number 64 specifies the quantity of the Bhairava-Tantras and the quantity of arts and crafts reflecting the number of Moon’s phases in a month of 32 days (12 such months constitute a big year of 384 days.)

The interrelation of the Vedic texts is obvious. Traditional Vedic method of interpretation of this literary complex emphasizes logical unity of all the texts. However, the method developed in modern indology is based upon a strange persuasion that independent schools and sects had created this extensive literature spontaneously during very long historical period. This approach benighted indology and history of Indian astronomy for many years.

Having established with mathematical accuracy coherence of all the parts of the Vedas (see ch. on mantrō-zodiac code) and taking into account ‘calendar’ classifications of other Purāṇic and Tantric texts, it is not difficult to draw a conclusion that all of them are organized around the same astronomical scheme forming daily, monthly, annual or long-term cycles.

Searching for the most appropriate metaphor explaining the nature of the Vedic literature, I have turned to a modern concept of hypertext.

As you must know, creation of this concept go back to 1945

when Vannevar Bush had written about his vision of memex, a computer of the size of a small table which could provide to users access to growing library of scientific literature. Memex should have combined a microfilm and the mechanical devices intended for linkage of huge quantity of information. This vision has inspired researchers in the area of hypermedia.

The founder of the doctrine about the hypertext was Ted Nelson who has offered this term in 60-s. The idea of Nelson consisted in that users of computers could examine the text and the images connected thematically in a nonlinear way. He insisted on that interfaces of computers be subordinated to cognitive needs of people and give to users management of decision-making. As he said, ‘my tested ancient definition of the hypertext is the following: it is the nonlinear text in which the user can move freely...’

As in the area of hypermedia and hypertext the basic marks are memex, system of editing of the hypertext (the system of the automated workplace developed by T. Nelson,) NLS/Augment (the first, but extremely complex hypertext system developed by Duck Enckelbart, project Xanadu (the project of the hypertext of Nelson,) so in the area of the Vedic chronopoetics developed millennia ago there are marks, such as

- techniques of memorizing huge sacred texts;
- anonymous collective editorial work of academies of highly trained Brahmans completely understanding and honoring traditions of the school (gotra,) their specialty or ‘branch’ (śākha) and tradition (sampradaya);
- academies and assemblies (pariṣad,) where procedures of recitation and interpretation of the Vedas were verified;
- strictly standardized in the Kalpa-Sūtras the Vedic ceremony (yajña, sattra and so forth) facilitating the Vedic recitation by involving not only the verbal and figurative memory, but also the motor memory of ritual actions;
- a system of the mythological-astronomical iconography;

- techniques of manufacturing mathematical-astronomical altars and their designing with the help of Śulva-Sūtra geometry;
- a system of integrally interconnected exegetical sciences including:

1. exact ternary or higher phonology;
2. algebraic synthetic grammar;
3. algebraic binary metrics;
4. symbolical language (pratik-bhāṣa) and poetics of the latent sense (alaṅkara, vakrokti, rasa, dhvani) and absolute harmony (aucitya);
5. lexicography and astroetymology;
6. astronomical ritual and
7. mathematical astronomy; and also
8. ritual music;
9. ritual theatrical action;
10. mythological poetry in the form of kāvyas and mahākāvyas;
11. cyclic Purāṇic mythology of the calendar chronocosmos (consisting of descriptions of creation, destruction and repeated recreation of the lunar and the solar lineages;) and even
12. an encyclopedic ethics based on principles conformed with the age, temperament, professional orientation, and assisting person easily and deeply to seize a set of texts of various content and to learn to use them in the framework of strictly outlined tradition and ritual.

Enigmatic syncretic texts of the Saṁhitās are explained in logically connected with them exegetical texts: the Brāhmaṇas and the Upaniṣadas (the first can be considered as some kind of astronomical-liturgical comments and the second ones as, mainly, psychological-physiologic explanations); the Vedāṅgas and the Upa-Vedas, the Sūtras and the Śāstras, the Itihāsas and the Purāṇas, the Āgamas and the Tantras.

The Purāṇas, the Itihāsas and the Kāvya (poems) represent

chronomythological texts explaining the Vedic myths only mentioned in the Vedas.

The Sūtras giving the brief ‘pieces’ of logically coded and ordered scientific information are related to the Śāstras (ethical-legal treatises,) the Darśanas (special philosophical disciplines) and the Bhāṣyas (textual commentaries) of various levels. Their purpose was more adequate and detailed explanation of various terms and concepts mentioned in the Saṁhitās.

Student of the Vedas receives in the early childhood originally short mantra full of riddles. Reflecting above various aspects of the aphorism, he is gradually involved in studying many exegetical disciplines. Each word, be it a name of a mythological personage or a technical term, has a set of more and more complex definitions. The information is given in strictly measured pieces:

- mantras,
- karikās,
- ślokaś,
- pādaś and so on.

The author trained in special authorial system named kavi-śikṣā (‘training of the astronomer-poet,’) can use the text of any Sanskrit or other source to create the new Sanskrit hypertext document, that is, the document by thousand references related to previous tradition and hinting on adjacent layers of knowledge.

The Vedic knowledge is well organized around the Veda-Saṁhitās according to procedures of samāsa (‘conjoint reading’) and vyāsa (‘separate, compound,’) is classified and interconnected to auxiliary information blocks. Texts are frequently given in a summary and supplemented with indexes, tables of contents (anukramaṇikāś) and cross references.

The concept of bīja (‘grain’ or a minimal piece of information) pushed authors to plan reasonably the quantity and type of links in the Vedic documents.

The good index provided readers with a guidebook on the Vedic

document, whereas the system of symbolical authorship, classification of texts and dedication to their various deities organized texts in groups and categories. These texts existed in oral tradition, which needs a developed 'technical' device of storing. Really, even now there are people remembering up to 25 volumes of 500 pages each (for example, all the Buddhist canon.)

Just as in a modern hypertext document, images and a graphic interface with various symbols allow to start and operate display of the information so a lot of riddles, puns, religious-astronomical metaphors mentioning certain realities or names of gods in connection with mysterious episodes or their feats, send the 'reader' to explanations in other texts.

In usual linear reading, the use of references sometimes represents enough bulky process. Meeting an unknown word, we go to the end of the book or to another book, say, to an encyclopedia. But in an educational system based on learning by heart a set of texts and indexes to them, process of specification of this or that concept or clearing of this or that place with the help of an other text is carried out even faster than in a computer. The computer in this connection can never become more reliable and faster than the human memory trained in appropriate way. It can serve as one of the mnemonic facilities. As a global help system of the unessential information, computer has conclusive advantage, though. Seeing the ease of organization of cross references, any person can use resources of the network turning into the central storehouse of information actually on any topic, connecting documents, which can be stored physically in different places worldwide.

As against the World Wide Web, in which there is no 'top' and at which it is possible to look from different angles, the Vedic texts are strictly stratified and differentiated according to the meaning and subjects. They also are distributed between different Vedic schools, obviously, functionally, and they demand, thus, the global coordination, which now becomes possible with computer networks.

All this permits to speak about the Vedic chronopoetics as an original calendar hypertext model, which anticipated the modern doctrine of hypertext. The Vedic texts considered usually to be philological compositions may represent actually, not figuratively, a kind of chronometric software designed for human brain as bio-processor carrying out continuous synchronous tracking of astronomical phenomena.

The main distinction between human bio- and electronic computer consists in that the former utilizes the direct electric current and the latter alternating one. That provides more flexible and reliable functioning of the human memory. Hence, the importance of the analysis of human mind as a bioprocessor and its control with chronopoetic texts as software programs.

Modern computer engineers understand the importance of the analysis of the human brain as a bio-processor. However, they chose a very expensive and harmful way of exteriorized computing transplanted into engineering. They already attempt to project quantum processors and computers with the interchangeable cells reminding neurons. Ancient engineers elaborated control of the brain with the help of the technique named svadhyaya (learning and repetition by heart) of the Vedic chronopoetic computer programs.

It is known that the Vedic experts are frequently very much gifted in calculations and have extraordinary memory and other excellent abilities. Texts of yoga give detailed accounts of such abilities. It is also curious that they include in their lists also long astronomical observation, ability of a correct astronomical prediction and astronomical intuition (see the ‘Yoga-Sūtra;’ the ‘Vijñāna-Bhairava,’ etc.)

Even a small deviation in the number of syllables makes the clock-chronometric function of the R̥g-Veda scarcely probable. The maṇḍalas made either multiples to ten or smaller than 30 and bigger than 200 exclude this possibility at all. The extraction of two maṇḍalas also eliminates the possibility of constructing astronomical values.

The estimated probability of built-in chronometrical draft in the Ṛg-Veda gave us impetus to conclude that the maṇḍalas constitute an optimum basis of the year calendar constants. Besides, the elements of this additive space of astronomical values are expressed as the sums of the elements of the basis. Every element of the basis enter a particular sum only one time.

Analyzing the obtained combinations, we observed that the all ten maṇḍalas were used, that is, the proposed basis is not excessive, does not contain surplus elements and permits to obtain the whole aggregate of calendar constants including the leap years.

Our postulates are:

- The true dimension of the Vedic cosmos should be measured through a digital chronopoetics.
- Vedic texts using symbolic language and syllabic metrics anticipate modern hypertextual computer programs.
- Vedic Gods are time symbols devised as visual program icons or mental aids for the aims of oral ritual chronometry.
- Lunar Gods (Candra, Agni, Indra, Soma and others) form the nucleus of time computing in the chronomythological poetics.
- Other planetary Gods form the shell environment making this poetics more spacious and precise.
- The Night sky (especially in winter) with the lunar zodiac composed of 27-28 asterisms or nakṣatras plays the leading role of a mainframe server in the universe-shaped computer-net with the Sky as a big display and the human being as an interface.
- Discovered digital codes and mythological encryptions, hypertextual organization of the Vedic mantras and isomorphism of their quantities with calendar periods demand scrupulous decoding of this compact prodigious operating system of Lunar-Solar navigation containing apart from great ethical, psychological and ecological message a digital signature of a supercivilization.
- Proto-Indian inscriptions must be decoded in the same chronocomputer Vedic frame.

- The most adequate presentation of the Vedic cosmos would be a modern multimedia astronomical laboratory, which would use instead of geometrical symbols of planets and constellations icons with images of the Indian ‘gods’ dynamically replacing each other according to the movement of planets and connected by a hypertext with mythological animated cartoon sequences, accompanied by mantras sung by brahmanas in a correct rhythm during Vedic ritual displaying beauties and ‘miracles’ of the magnificent night world.

13. SCIENTIFIC (PURVAYAJNIKA) INTERPRETATION

Veda-cakṣuḥ kiledam smṛtam jyotiṣam...

The astronomy, according to tradition, is called the eye of the Veda in view of its importance among all other organs.

Bhāskara⁶⁸

The secrete purport of the Ṛg-Veda, indisputably, lies deep hidden in the tenets of the jyotiḥ-śāstra (mathematical astronomy,) which was justly compared by Bhāskara to the eye, the main vital 'organ' or science (vedāṅga) of the Veda.

The very phenomenon that the Vedas still subsist despite all ravages of time is testimonial of its unprecedented scientific significance. Undoubtedly, this paradox demands an explanation. And there is no lack of them, one being more extravagant than the other. It is even difficult to disentangle a few facts from a mass of fable created by ingenious minds. Privileges to read and understand Sanskrit sources are granted to a chosen few. It affords ample excuse for multiple perverted notions and theories.

To tell the truth, the Vedas, gradually opening its facets and hidden meanings, remain investigated only superficially, their most essential nucleus remains not understood. However, as new Vedic texts are encompassed by researchers, it becomes more and more clear that the ancient Vedic scientific methodology does not essentially differ from the modern exact science.

Naturally, the vagueness of the first science-oriented theories was the cause of the serious skepticism. Multiple references to basically astronomical calculations recovered by H. Jacobi and B. G. Tilak were considered in the last book of D. Chattopadhyaya as 'so desultory and what is worse, so deeply embedded in discussions con-

⁶⁸ Cit. K. Madhava Krishna Sarma, Varāhamihira. In: Scientists, New Delhi, 1976. P. 73.

cerning ritual trivialities and theological disputations that it is indeed difficult to imagine people with any genuine interest in astronomy talking of astronomy in such a casual manner and using astronomical knowledge for this kind of mystery-mongering.⁶⁹

D. Chattopadhyaya really was skeptical to the extent of saying that ‘from what we actually read about the technological development of the Vedic people in the R̥g-Veda itself, it requires a great deal of Aryan chauvinism to imagine that during this period of the oral composition of this vast literature they could by any chance improvise the time-measuring instrument something quite sophisticated as judged in the ancient context.’⁷⁰

This skepticism, however, in its turn, is the consequence partly of the non-contextual and non-semantic approach to the Vedic texts (which narrows the past with literal word-for-word translations of the sacred texts into modern languages) partly of the modernization of the past, which consists in superimposition of modern lineal discourse on the ancient multidimensional polysemantic syncretic text.

The progress towards more and more consistent astronomical interpretation is obvious, though. G. Dumesil emphasized cosmic and social functions of the Indo-European Gods. B. Oguibenin supports the cosmological theory.⁷¹ D. Frawley sees in the Vedic Gods symbols of light and astronomy.⁷²

The majority of Sanskrit scholars (A. Bergaigne, K. F. Geldner, V. Henry, J. Kuiper, A. Ludwig, A. A. MacDonnell, M. Müller, H. Oldenberg, P. Pischel, L. Renou, B. G. Tilak, M. Witzel) interpret

⁶⁹ D. Chattopadhyaya, *History of Science and Technology in Ancient India: The Beginnings*, Calcutta, 1986. P. 254-255.

⁷⁰ D. Chattopadhyaya, *History of Science...* Opp.Cit. P 273.

⁷¹ Boris Oguibenin, *Structure d'un myth védique. – Approaches to Semiotics*. 30. – The Hague, 1973.

⁷² D. Frawley, *The Hymns from the Golden Age: Rig Vedic Hymns with Yogic Interpretation*, Delhi, 1986. P. 7.

the Vedic Gods as physical, mainly astronomical, phenomena.

J. N. Bhasin⁷³ and J. K. Trikha⁷⁴ regard the Vedic Gods without any hesitation as symbols of astronomy.

T. Y. Elizarenkova observed a strange present time alignment of the greater part of the Rigvedic hymns in her paper prepared for the IXth World Sanskrit Conference.⁷⁵

P. A. Grintser (in a similar paper entitled ‘A Lunar Myth in Bāṇa’s Kadambarī?’)⁷⁶ recognizes the predominance of Lunar symbolism in the Vedic mythology and classical Sanskrit kāvyas. From his next publication (‘Bāṇa’s Kadambarī and poetics of Sanskrit novel’ (see his Addenda to the Russian translation of ‘Kadambarī’,) it follows that he is persuaded that, at least, in later hymns of the Ṛg-Veda (X.85,) Soma is a lunar deity. Later, he says, identification of celestial Soma with the Moon became generally accepted and as a lunar god Soma is worshiped with the stars.⁷⁷

Besides, he had previously noticed the calendrical arrangement of epic recitation as it is depicted in the Mahābhārata and the Rāmāyaṇa with the basic astronomical constant such as the year.⁷⁸

As we shall see later during the analysis of the Vedic astromy-

⁷³ J. N. Bhasin, *Astrology in Vedas*. Delhi, 1984.

⁷⁴ J. K. Trikha, *Rig Veda: A Scientific and Intellectual Analysis*. Bombay, 1981.

⁷⁵ T. Y. Elizarenkova, ‘One’s more about the conception of time in the Rgveda.’ In: *The IXth WSC Contributions of Russian scholars*, Moscow, 1993.

⁷⁶ P. A. Grintser, ‘A Lunar Myth in Bāṇa’s Kadambarī?’ In: *The IXth WSC Contributions of Russian scholars*, Moscow, 1993. P. 21–31.

⁷⁷ P. A. Grintser, *Bāṇa’s Kadambarī and poetics of Sanskrit novel*. In: *Bāṇa. Kadambarī*. Moscow, 1997. P. 455. (In Russian.)

⁷⁸ P. A. Grintser, *Ancient Indian Epics. Genesis and Typology*. Moscow, 1974. P. 27. (In Russian.)

thology, almost all main Vedic gods were personifications of lunar phases and other lunar and planetary phenomena.

The caledrical character of many Proto-Indian seals becomes more and more evident from the studies of scholars led by A. Parpola (S. Parpola, S. Koskenniemi, P. Aalto)⁷⁹ and Y. V. Knorozov (M. F. Albedil, B. Y. Volchok and others.) A. Parpola in one of his works devoted to Harappan civilization asserts that the astronomical themes are present in the layout of Indus Valley cities and is of immense significance for the study of the Harappan civilization and its script. He shares the assumption that the account of time was at basis of the Vedic altars, and the lunar zodiac consisting of 27-28 constellations was reflected in all the Vedas and has a parallel in some Chinese and later Arabian materials. The concept of lunar zodiac goes back to the period of early Harappa, which should be considered as its native land.

D. Chattopadhyaya does not exclude the possibility of direct influence of Harappan mathematics, technology of brick making and astronomy on the literary editors of the Vedas, whom he, however, wrongly considers derivative writers.⁸⁰

Paule Lerner regards astronomy and astrology as the key to the interpretation of the Mahābhārata's names of the main characters and episodes. The plot itself is treated by her as a mythological picture of the important precessional shift.⁸¹

All these theories, however, are more or less correct reasons and guesses leaving a set of open questions, the non-authorized doubts and dark spots. If you have lawful question, why texts do not give consistent answers in front of such abundance of astronomical evidence,

⁷⁹ A. Parpola, *Deciphering the Indus script*. Cambridge: Cambridge University Press 1994. Pp. 201–206, 241–246.

⁸⁰ D. Chattopadhyaya, *Op. Cit.*. Pp. 253, 259.

⁸¹ P. Lerner, *Astrological Key in Mahābhārata*, Delhi, 1988.

one of the explanations could be that thanks to Copernicus and other European ‘reformers’ of astronomy, direct astronomical observation from the Earth was, in my opinion, unfairly replaced with theoretical, speculative description of the solar system as though observable from the North star, with so-called ‘heliocentric theory’ (the term absurdly suggests the idea of the observer actually located on the Sun – more correctly this theory should have been labeled Polar centric.)

This view, as Copernicus admits, had been suggested by ancient scientists. However, let us note that, if it was one of many principles of astronomy in antiquity, since Copernicus times, it became unique and indisputable. That has resulted in destruction of very bases of astronomy as observational natural science discipline, and in its transformation into a kind of a sacral speculative scholasticism pre-occupied exclusively with astrophysical theoretical rezoning and cosmology saturated with superstition, rather similar to a religious superstition.

For example, the known English theorist Stephen W. Hoking who developed the doctrine about the mechanism of formation and ‘evaporation’ of ‘black holes,’ that is, about their ability to lose energy and substance (Hoking’s effect – I do not intend to scoff at his ideas,) recently has denied his own theory that the whole galaxies can completely collapse in ‘black holes.’ Similar theories can be considered remarkable, only if to prescind from that the space is one boundless ‘black hole,’ where the search of ‘black holes’ represents the next vicious circle, which is similar to theological disputes of medieval scholasticism.

Today in astronomy, instead of a direct observation a belief in correctness of mathematical calculations and physical postulates of modern theoretical cosmology, looking on the world through devices and being in continuous process of vain self-reforming, in which the only definite thing is that as soon as there is a certain similarity of stability, it is thrown down with a good many principles by hot-heads more refined in casuistry. As a result, ancient metaphors and

hyperboles having the firm scientific basis in observant astronomy, have started to be interpreted – frequently not without intention – literally and quite often have been turned into a piece of nonsense by Copernicus’ followers.

It is, unfortunately, the destiny of the Indian and Greek mythological traditions, as well as of all other great mythologies of antiquity. For example, the word ‘Hyperborean’ in the Greek mythology meant ‘people’ living in eternally warm and solar region, located in the ‘northern country,’ being a source of ‘northern wind,’ or in paradise, a realm of eternal youth. It was ‘people’ worshipping Apollo (the Bull or Taurus,) that is, the spring’s Sun. In modern times, it has turned to mean simply ‘inhabitants of the far North,’ the Arctic zone characterized by cold.

Such change of meaning is a consequence of change of a point and object of vision. So-called ‘Northern Earth’ was originally a symbol of the first lunar quarter, when a new moon is born, which, according to strict direct observation, moves to the North, and also the spring-and-summer period. Precisely as in the Vedas, ‘the Northern way of the Sun’ (uttarāyana) is symbol of spring and summer.

Therefore, the theory of the Arctic native land of Aryans (as well as hyperboreans) advocated by B. G. Tilak and after him by some scientists and archeologists, undoubtedly, is really a funny piece of nonsense, a consequence of this error. Such being the case with the overwhelming majority of modern theories of ancient culture, the ancient astronomy has been demagogically proclaimed a by-product of an astrology whereas the whole thing was just the opposite, as it was shown by B. L. Van-der-Waerden, O. Neugebauer, D. Pingree and others.

My logical approach, a direct output of the previous analysis, is indirectly justified by the remark of Yāska, who says: ‘Touching upon the mantras, nobody can pretend to understand their meaning unless he is a ṛṣi or a spiritual genius... When the ṛṣis had disappeared, the men asked the Devas: ‘Who will be the ṛṣi for us?’ – The Devas had

given them the reason as a leader. That is why, the person who speaks reasonably, in harmony with the meaning of words, becomes as good as the utterance of a ṛṣi... This knowledge is a kind of revelation and dawn of the reason. Its main object is to be comprehensible spiritual enlightenment' (Nirukta, XIII, 12.13.)

The significance of astronomy is attested by the inclusion of astronomy into the set of special Vedic disciplines. Second, this way of interpretation was the most ancient and authoritative according to the Brāhmaṇas, the most ancient Vedic commentaries. Thirdly, The Vedas were kept in an unchanged form, despite of all misadventures of the Indian history of the last several thousand years. All that speaks about their unprecedented scientific importance, which, in our opinion, cannot be anything other as the importance of calendar and, accordingly, astronomy.

It is also to be kept in mind that there is a huge mass of Vedic texts of sufficiently remote antiquity with a scientific (astronomical and other) purport such as the Brāhmaṇas, the Vedāṅga-Jyotiṣa, the Śulva-Sūtras, the Purāṇas, the Tantras and the Itihāsas.

But when treated in the frame of a static descriptive cosmography – a very common affair – even the most attractive mode of interpretation, the cosmic symbolism of the purvayajnikas, which postulated an astronomical significance of the Vedic rituals becomes desultory and inconsistent.

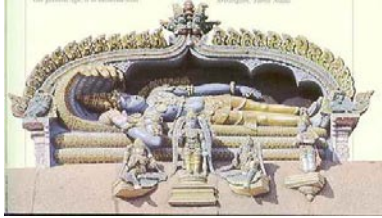
The incontestable, finished elucidation and decoding of the Vedic Gods, ritualistic recitations and enigmas will become possible, I am sure, only in the Vedic context of ṛta ('Order') and amṛtā ('Eternity') or annual and monthly cyclic movements of the planets, an Eternal Calendar.

In the present form, the Vedas are the most majestic and mysterious heavenly (astronomical) drama with hundreds of divine characters, which, undoubtedly, are embodiments of the planets and time units co-operating in constant cyclic movement – ascending, opposing, entering in conjunctions and eclipsing each other, descending,

and talking with each other or singing. The effect of this sacred drama upon the audience largely depends upon the success with which the illusion of eternal unlimited time and its cyclical circulation represented as a divine competition as though really occurring is supported. This is the condition sine qua non of every scenery production.⁸² In the case of the Vedas, even the smallest discontinuity of time, the slightest interruption, which had been already noted in connection with mīmāṃsā and which will be discussed further in chapters about chronometry, destroys this illusion. All this is evidence of interlinking of the Vedas with the highest science of precise calculations.

These conclusions led us insistently to the argument that the Ṛg-Veda is primarily a source of history of calendar.

In this light, the traditional approaches to the Vedas and in general to the Sanskrit literature, ethics, science, education and civilization should be adjusted to the new vision opening new vistas and new dimensions. Besides, these issues should be acknowledged in the long debate concerning the adoption of the universal eternal calendar.



Vishnu

⁸² G. S. Mahajani, Search for universal principles of literary criticism. In: Principles of Literary Criticism in Sanskrit. Ed. by Dr. R. C. Dwivedi. Delhi, 1969. P. 1-4.

14. THE VEDIC EXACT SCIENCE

Nachiketas: What is the nature of Brahman?

Yama: Even celestials do not understand the true essence of Brahman as the doctrine about Brahma is rather difficult and deep.

*Katha-Upaniṣada 1.16;
Agni-Purāṇa, 385.*

Due to objective and subjective reasons, European scholars of the XIXth and the beginning of the XXth centuries though occasionally recognizing the great achievements of the ancient Indians in the field of philology, grammar, art, religion and philosophy, refused persistently to acknowledge their practical reason, science and technologies. This skepticism and criticism towards ancient Indian science was expressed with a host of indiscriminate arguments even by such prominent indologist as late Prof. Debiprasad Chattopadhyaya in his last work devoted to science and technology in ancient India.⁸³

This skeptical attitude is rather characteristic of all Western indology, as a rule, trudging behind natural sciences and clinging tenaciously to the most primitive arguments and methods of natural sciences, such as reductionism and vivisection. This mind-set is sarcastically depicted by the American biochemist of the Hungarian origin, one of the founders of bioenergetics, the Nobel price winner (1937) Albert Sent-Dyördji, in its trilogy devoted to the problem of cancer: if a dynamo-machine is given to a chemist for analysis, the first thing that he would do with it would be its plunging into a solution of sulfuric acid.

Besides, it is known that within five centuries of hostile Muslim rule a huge part of scientific information was irrevocably lost. Religious texts were rescued first, exact and applied sciences suffered most. A significant part of sacred scriptures was rescued, but exact methods of their interpretation and application were forgotten. Scien-

⁸³ D. Chattopadhyaya, Op. Cit. Pp. 404-405.

tists now decipher ancient Indian mathematical and astronomical texts without keys, trying to restore the lost terminology, methodology, hermeneutical and cultural paradigm, applying modern philosophical and methodological methods. The linguistic and mythological analysis is based on rather confused and inconsistent methodology.

It was difficult to hope that a serious breakthrough in objective study of the ancient Indian scientific heritage will be easily accepted by the scholarly community. However, during the last decennial, more and more scholars began to depart from traditional Eurocentric views and to search for more balanced approach defended by many leading Indian historians, archeologists and philosophers. The logic of researches inevitably brings most inquisitive scholars to recognition of secret scientific meaning in the Vedas and puts a problem of deeper and adequate decoding of a special code of the Vedic texts.

Usually, it is admitted that it was India, which gave to the world a decimal notation. However, many critical researchers determine the initial stage of its formation only as the middle of the first millennium C.E., that is, as the post-Vedic period. Such dating snarls a simple problem of the origin of the decimal account, distorts the meaning of the Vedic knowledge and the history of natural sciences. Those, who have realized it, have no keys.

Other notations developed in ancient India besides decimal one (for example, the binary and ternary codes being absolutely not less significant,) remain less investigated and less known. The value of binary code for development of science was brought into focus by historians of mathematics only during the last century in connection with development of computer science. A few guess the existence of a ternary code in the Vedas.

Ancient resettlement from India, in particular, caused wide dissemination of the Vedic philosophy and science in the South, the East and the West of Eurasia, which substantially determines the character of modern Asian and European mentality. Its main principles and purposes have not been completely forgotten and lost. They are pres-

ent ‘invisibly’ and define the character of the modern European and, hence, world civilization. This circumstance also gives us confidence that, following modern scientific methods, it is possible to comprehend correctly the ancient Vedic philosophy and science.

It is known that, in the Middle Ages, grammatic means of Sanskrit were widely used for coding big astronomical numbers and as logic quantifiers by creators of the Indian formal logic *navya-nyāya*.⁸⁴ By the way, the latter circumstance again points at that development of refined mathematical theories in the Middle Ages, undoubtedly, had, at least, a significant preparatory period. Moreover, it points at that exact (astronomical, mathematical, logical and other) knowledge was at times coded by means of an ‘ordinary’ Sanskrit! It again forces to consider more closely the potential of the Vedic Sanskrit in the field of digital enciphering.

Then, if to follow the logic of the ancient Indian philosophers similar to Bhatṛhari and to take into account the positive guesses of modern archeologists, historians not excluding the intuitions of the New Age ‘postmodernists,’ it is easy to accept the idea of a hidden content behind the elaborate Vedic design of storing, transferring and hermeneutical processing of digital information.

The Vedic system includes alongside with grammatic and phonetic, prosodic, semiotic-etymologic-mythological, textual, logical, psychological, metaphysical, ritualistic, theatrical, musical, stylistic-aesthetic principles of its functioning. A great deal of natural science, mathematics and astronomy was strangely enough intermingled with these linguistic methods. Besides, all these principles are described together with the methodological rules of their application.

The name ‘Vedas’ comprises within its scope namely a complex of philological, philosophical, natural and applied sciences. Actually, this complex of sciences includes astronomy, mathematics, physics, medicine, psychology, logic, linguistics and many other exact sci-

⁸⁴ Daniel Henry H. Ingalls, *Materials for the Study of Navya-Nyaya Logic*, Cambridge (Mass.) – London, 1951 (Russian tr. M., 1973.)

entific disciplines with all necessary departments and methodological toolkit. In this connection, it is extremely strange that central or ‘supreme’ (Sansk. para, ‘top’) departments of this complex represented by the Vedas have, in opinion of a ‘scholiast,’ only literary and mythological value.

On the other hand, you cannot reject that for spiritual unity and harmonious functioning of the greatest civilization of antiquity a special chronophilosophy and technology, including a clock device, a calendar and astronomical tables were indispensable.



Original chronophilosophy (kāla-vada, ‘the science of time’) is really extant within the epic narration of the Mahābhārata, methodically explained in the Śāstras, the Purāṇas, the Tantras, the astronomical siddhāntas and other special treatises. The belonging of the chronophilosophy to the Vedas is obvious from enumeration of its main departments in the Upaniṣadas and from its inclusion into the smṛti (‘lore’) part of the Vedas.

It is curious, whether there is the authentic way sanctified by the Vedic tradition itself, which would allow cracking the secret of the Vedas. It seemed that it was lost forever.

Until recently, I could not even dream of proving my own courageous assumption, which I had put forward intuitively in 1993 that the Vedic mantras could have represented astronomical planetary tables or, probably, mathematical tables of sine or chords.

They really resembled something similar, but it seemed that it was impossible to find at that time any substantial mathematical validation. And the idea seemed lunatic. I have returned to this idea of the Vedic astronomical table much later and not without the happy

hint. I shall relate this story shortly. The ‘magic’ key was found by Natalie Mikhailov. That knowledge, which it allowed to reconstruct, must be analyzed from the point of view of many sciences, first of all, mathematics, astronomy, computer science, history of civilization. We have to find out its former applications, its reliability and its importance and applicability in present day astronomy and computer science... It is early to make forecasts, especially, final conclusions. But one point is clear – we have a tempting opportunity to do away with some stereotypes and find new ways to comprehend the most ancient scientific tradition, which even many conservative Western researchers describe as the cradle of world civilization.

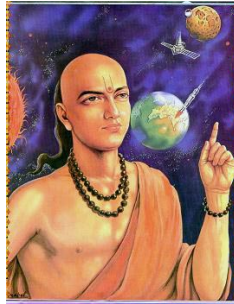
It has been already established that the Vedic erudition was based upon scientific outlook, a comprehensively developed philosophy including deep epistemology, logic, psychology, ethics, textual criticism and many other auxiliary disciplines. The Vedic astral religion is a worship of planets and stars of the Solar system, which in Vedic mythology appears as the family of Brahma (the Sun, the creator or the father of the Solar universe and of all of its phenomena.)

At ontological level, the universe of the Vedas is a sum total of aggregative states of matter unified by spirit or visible and hidden light of the Sun, with corresponding organs of action and perception, which in different combinations generate all phenomena of the organic and inorganic nature.

At an ethical level, the universe of the Vedas is a uniform field of eternal life, full of light, truth and pleasure (sat-cit-ānanda.) This vision propels Vedic thinkers to active vital attitude to the world, to ecological global ethics and, as consequence, to a system of techniques of all-round self-knowledge and self-control, the responsibility for all world and to belief in truth and force of knowledge.

At a level of science, the Vedic outlook manifests itself as the ramified system of disciplines about human being, the world and knowledge. At times, these theoretical and applied disciplines are advanced up to such degree that quite bear comparison with modern

ones or even surpass them by their logic harmony, depth of analysis, breadth of generalizations, synergy and high artistry inherent in all of them. Compressed and laconic mode of expression of sutras' formulae testify to conclusive advantages of the philosophical method, upon which they are based.



15. COSMOLOGICAL INTERPRETATION

T. Y. Elizarenkova, following the theory of F. B. J. Kuiper, believes that in the last account it is cosmology explaining the world's evolution, which is the key to the understanding of the Vedic religion.⁸⁵

Philosophical Vedantic vision of the world of Mahesh Yogi is supported with modern superstring models of the unified field theory, in which great synthesis of all four interactions (strong or nuclear, weak or internuclear, electromagnetic and gravitational) is carried out. The gravitational interactions are isolated usually in ten imagined (nonexistent) spaces.

It is necessary, probably, because gravitation as it was thought in heavenly mechanics of Newton, simply does not exist.

The theory of gravitation was formulated in India 1,200 years before Newton by the ancient Indian astronomer Bhāskaracharya, who notes: 'Objects fall on the Earth; Planets, Constellations, Moon and Sun are held in orbit due to attraction.'

Paradoxically, all attraction's phenomena can be explained more strictly with the theory of general repulsion or general rotation.

Paul Steinhardt from Princeton University and Neil Turok from Cambridge University have proposed a new 'CYCLIC MODEL' theory. The idea has been debated within the cosmological community from 2001.

Magnetic field, according to A. Einstein, is diffused substance, while the basic property of substance is tension and repulsion. Astrophysical discoveries of recent years speak about a new field of repulsion, which is ostensibly responsible for expansion of the

⁸⁵ T. Y. Elizarenkova, *Yazik I Stil Vedyiskih Rishi* (Language and Style of the Vedic Rishis). Mos-cow, 1993. P. 496.

universe. However, the expansion itself, to my mind, is a similar illusion as visibly ‘bursting’ gravitation. The overwhelming majority of modern scientists consists of reductionists, looking for rectilinear and unequivocal answers to complicated questions. Whereas our world is governed by very subtle laws of general interaction like such ‘strange’ phenomena of microcosm as, for example, ‘quantum embroilment,’ when change of one particle generates change of another independently of distance (this phenomenon is already being adapted to quantum computer.)

Anyway, mathematical organization of the Vedic texts leaps to the eye and is widely used even in controversial speculations.

Dr. Raja Ram Mohan Roy of the University of Toronto also asserts in his book ‘Vedic Physics: Scientific Origin of Hinduism’ that the Ṛg-Veda is written in a coded manner. But he believes, being limited only to mythological vague interpretations, that it is only in the framework of cosmology, that these texts make sense. He tries to justify the view that the Vedic sages had discovered the subtle nature of reality, and coded it in the form of the Vedas. The Ṛg-Veda is interpreted by him as a book of particle physics and cosmology, which was gradually forgotten over time.

Leaving aside his vague insistence on cosmology, justified only by references to the Vedic mythology, let’s note his affirmation that the Ṛg-Veda is a book of science, and the only reason that we have not been able to understand the science in it is because of the layers of ignorance and misinterpretations that have accumulated over the millennia.⁸⁶

⁸⁶ Raja Ram Mohan Roy, Vedic Physics: Scientific Origin of Hinduism, Toronto, 1999.

16. MATHEMATICAL INTERPRETATION

Mathematician Prof. S. K. Kapoor assumes that Vedic knowledge is organized on geometric format, and as such, this knowledge is mathematical. He attempted to prove harmony of the Vedic numbers in the frame of the theory of multidimensional cubes.

Bharathi Krishna Tirtha has unfolded some important principles of Vedic mathematics and insisted on the mathematical design of the Vedic literary cosmos.

Character of Vedic Mathematics

'It was India that gave us the ingenious method of expressing all numbers by the means of ten symbols (Decimal system).. a profound and important idea which escaped the genius of Archimedes and Apollonius, two greatest men produced by antiquity.'

**Pierre Simon Laplace, 1749–1827,
French astronomer and mathematician.**

More steadfast attention of the researchers to the Sanskrit scientific heritage began to be given only since the second half of the XXth century. The majority of works at the initial stage of this study had gravitated to philological and religious-philosophical themes, to which, in due course, linguistics, astronomy and medicine had been added. However, for example, such important discipline as the Vedic mathematics dropped out of the field of vision for a long time.

Only since the 30th of the XXth c. and, mainly, after the II World War, publications on the history of Indian mathematics, technology and other branches of exact and natural sciences began to appear on a regular basis. Many important Sanskrit scientific treatises were translated into the English language such as 'Āryabhaṭīya of Āryab-

⁸⁷ W. E. Clark, editor, The Aryabhatiya of Aryabhata, Open Court, Chicago, 1930.

haṭa.⁸⁷ The 70-page manuscript on the birch bark (35 from them are well read) found in Bashkali in North-Western India in 1881 contains a precious information on the Indian higher mathematics.

The synopses of Indian science by F. I. Shcherbatsky, G. M. Bongard-Levin, A. Basham⁸⁸ as well as popular accounts of scientific achievements of ancient India in Russian and English⁸⁹ describe the Vedic disciplines in separation from each other, and many departments of the Vedic sciences including mathematics were portrayed schematically and in direct opposition to ‘sacral texts,’ the Vedas.

It reduces their value in the Vedic hermeneutics up to zero – whereas actually the exact sciences play the main role in the Vedic calendar-astronomical observation and in the Vedic philosophy, perfecting consciousness and imagination of a person with such great scientific concepts as infinity, cyclicity, sphericity, ultimate accuracy of differential analysis etc.

The ancient Indian mathematical heritage is analyzed in greater detail in works on history of mathematics of such authors as H. T. Colebrook,⁹⁰ L. Delbos,⁹¹ Bibhutibhusan Datta,⁹² B. Datta and A.

⁸⁷F. I. Shcherbatsky, Scientific achievements of ancient India. In: Select Works of Russian Indologists-philologists. Moscow, 1962. Pp. 254-270; G. M. Bongard-Levin, Ancient Indian Civilization: Philosophy, Science, Religion, Moscow, 1980; Ancient India. Historical Sketch, Moscow, 1969; A. L. Basham, The Wonder that was India, 1954 (Russian Tr. M., 1977.)

⁸⁸Culture of Ancient India, Moscow, 1975; D. M. Bose, S. N. Sen, and B. V. Subbarayappa (Eds.). A concise history of science in India. Indian National Science Academy, New Delhi, 1971.

⁸⁹H. T. Colebrook, Algebra, with Arithmetic and Mensuration, from the Sanskrit of Brahmagupta and Bhaskara, J. Murray, London, 1817.

⁹⁰Leon Delbos, Les mathématiques aux Indes Orientales, Gauthier-Villars, Paris, 1892.

⁹¹Bibhutibhusan Datta, The science of the Śulba: a study in early Hindu geometry, Univ. of Calcutta, Calcutta, 1932.

N. Singh,⁹³ O. P. Jaggi,⁹⁴ George Gheverghese Joseph,⁹⁵ Shrinivasa Iengar,⁹⁶ T. S. Bhanu Murthy,⁹⁷ O. Neugebauer,⁹⁸ D. Pingree,⁹⁹ S. B. Rao,¹⁰⁰ T. A. Sarasvati,¹⁰¹ A. Seidenberg,¹⁰² Van der Waerden.¹⁰³

Till 1978, eight volumes (including one on mathematics) of the Joseph Nidham's work 'Science and Civilization in China' had been

⁹³ Bibhutibhusan Datta and A. N. Singh. History of Hindu mathematics, Asia Publ. House, 1962. Reprint: Asia Publishing House, 1962.

⁹⁴ O. P. Jaggi, Scientists of Ancient India, Delhi, 1966.

⁹⁵ George Gheverghese Joseph. The Crest of the Peacock, Penguin Books, 1991.

⁹⁶ C. N. Srinivas Iengar. The History of Ancient Indian Mathematics, World Press Private Ltd., Calcutta, 1967.

⁹⁷ T. S. Bhanu Murthy, A Modern Introduction to Ancient Indian Mathematics, Wiley Eastern Ltd., New Delhi, 1992.

⁹⁸ Neugebauer O. The Exact Sciences in Antiquity. Brown University Press, Providence, Rhode Island, 1957. (Russian Tr. Moscow, 1968).

⁹⁹ D. Pingree, Census of the Exact sciences in Sanskrit. Four volumes. Amer. Phil. Soc. Philadelphia, 1970-1981; David Pingree, History of Mathematical Astronomy in India. In: Dictionary of Scientific Biography, Vol. 15, Supplement 1, N.Y. 1981.

¹⁰⁰ S. B. Rao, Indian Mathematics and Astronomy, Bangalore, 1994.

¹⁰¹ T. A. Sarasvati, Geometry in Ancient and Medieval India, Indological Publ., Delhi, 1979.

¹⁰² A. Seidenberg, 'The ritual origin of geometry'. In: Archive for History of Exact Sciences, 1962, 1, p. 488-527; 'The origin of mathematics.' In: Archive for History of Exact Sciences, 1978, 18, pp. 301-342.

¹⁰³ Waerden, Van der B. L. Science Awakening I: Mathematics of Ancient Egypt, Babilonia and Greece.) Moscow, 1959. (Russian Tr.)

published, in which science in India, in the Arabian countries and Europe had been also touched. This work substantially modernized the whole discipline.

The greatest contribution of Nidham, in opinion of Fritz Stahl, consisted in proving that the history of science in the Antiquity and Middle Ages can be studied only under condition if Eurasia is considered as one continent. He has shown, that Arabs, Chinese, Euro-Americans, Indians, and other inhabitants of this continent had been closely interconnected and cannot be investigated separately. The most part of sciences developed in close interaction, and cultural tendencies went from the East, reaching the Western Europe in the last turn. Then, they were transferred to Northern America and, at last, became global.

B. L. Van-der-Warden accepted the same point of view on spreading of ideas of geometry and algebra in the ancient world.¹⁰⁴

However, all these works analyze, as a rule, only some aspects of the ancient Indian mathematics, such as the theorems of geometry stated in śulva-sūtras,¹⁰⁵ the decimal notation and algebra of medieval Indian astronomers. Many European authors usually tendentiously underestimate astronomical dating of the Vedic texts, blindly following dates established by philologists, and quite often demagogically insist on that the Indian mathematics and astronomy developed under influence of ancient Greeks.

Proving our view of the history of ancient Indian mathematics, it would be desirable to note that, as it has been already mentioned above, sometimes, texts with natural science and mathematical content were included in sets of the Vedic compositions which have, apparently, extremely religious orientation. Therefore, it is well known that the ritualistic texts belonging to the Kalpa-Vedāṅga (the Vedic discipline regulating calendar ceremonies) include the Śulva-Sutras

¹⁰⁴ B. L. van der Waerden, *Geometry and Algebra in Ancient Civilizations*, Berlin, 1983.

¹⁰⁵ S. N. Sen, and A. K. Bag, *The Śulbasūtras*, New Delhi, 1983.

(geometrical treatises) describing construction of sacred ovens-memorials of various form and architecture with freakish bricks with strictly measured area and volume. The grammar of Pāṇini and the Chandaḥ-Śāstra of Piṅgala are written in algebraic form, and the latter describes a binary code used in the Vedic Saṁhitās in the most detailed way!

However, only now, the scientific content of these texts has begun to draw attention of historians of mathematics. F. Stahl mentions an opinion of Takao Hayashi (work is being prepared for publication) according to which ‘the Indian mathematics manifests itself in such disciplines as ritual, prosody, cosmography, calendar, book keeping and trade, and then develops in interaction with a horoscopal astrology and spherical astronomy.’ F. Stahl in a number of works has shown that the Euro-American historians of science trying to prove a priority of Greeks in mathematics unfairly select sources. So, searching for parallels to logical deductions of Euclid, they purposely ‘do not find’ them in the ancient Indian mathematical treatises, whereas it would be necessary to search for them in analytics of Sanskrit language of Pāṇini. The Indian science, in F. Stahl’s opinion, was inspired by grammar no in a lesser degree, than mathematics.

I can add that all the Vedic disciplines including algebra of the Vedic grammar, which should be called more likely analytics of language receive the substantiation only in integrated chronometric computer science and appear as special subdisciplines of the higher computing science.

The Vedic mathematics resembles modern discrete mathematics clearly outlining a metatheory of calculation, systems of decimal, binary and ternary calculation, an ideal scale of measurements, an advanced combination theory, elements of Boolean algebra or algebra of logic, necessary for description of any system based on a binary notation (which would be more correctly called algebra of Pāṇini and Piṅgala,) geometry, the graph and set theories (see. the Part II about Indus script,) quite probable presence of methods of the fast calculus,

the differential calculus, the advanced propositional logic with strict analysis of valid arguments, allowing to make correct conclusions about some set of facts and to sweep aside mistakes.

The researchers, though recognizing at times the important contribution of Hindus, their more advanced concept of zero (McQuillin) and hundreds practical mathematical algorithms (Jhunjhunwala,) frequently underestimate the value of the ancient Indian mathematics owing to their ignorance of the Vedic Sanskrit sources and wrongly attributing the greater value to Egyptians, Sumerians and Greeks.

The antiquity of the Egyptian mathematics is proved by the text of the Rhyndus papyrus, which is dated approximately 2000 – 1800 B.C.E., and some hieroglyphic inscriptions, which are going back to 2700 B.C.E., whereas blossoming of the Vedic mathematics goes back to the middle of the seventh millennium B.C.E. The Egyptian mathematics used relatively primitive decimal system of calculation, in which place principle and the decimal point were absent. There were seven basic figures for first seven degrees of ten. To designate a number, it was necessary to repeat a figure corresponding number of times and to add all the values obtained. There were not designations for numbers higher than one million and the designation of millions was rather bulky.

Babylon cuneiform clay tablets date from 2500 B.C.E., sometimes even from 3000 B.C.E. Tablets with mathematical data belong to the period from 1800 B.C.E. to 1600 B.C.E. Babylonians used notation with the base 60, possibly, because the number 60 has many dividers (2, 3, 4, 5, 6, 10, 12, 15, 20 and 30,) that makes it convenient for arithmetic operations and formation of fractions. It explains partly its use for designation of time (60 sec. in one minute, 60 minutes in one hour and 360 degrees in a circle.) Babylonians used elements of place value: the number, which is placed to the left of another, was bigger. In 1900 B.C.E., they new the theorem of Pythagoras minimum 1200 before Pythagoras, square roots and the notion of an empty position. So, the number 248 was expressed (if to present it

in a decimal designation) as follows:

$$2 * (60 + 60) + 0 * 60 + 8.$$

However, the use of zero at the end of decimal numbers or as number (not just a designation of a position) and general rules for the solution of problems and more abstract symbolical approaches are not found anywhere.

The Hindus, having completely investigating the sense of zero, having perfected the place system, having developed terminological designations up to billion and higher, having devised a lot of codes and propositional logic, appeared the most productive in the field of higher mathematics and produced the deepest influence on modern science.

Though zero or place system besides Hindus was used by Babylonians, Egyptians, Maya and Chinese, only Hindus learned to use a zero both as number and as a designation of a position in all kinds of operations.

In around 500 C.E. Āryabhaṭa devised a positional number system, which used the word 'kha' ('space, sky') for empty position. It was used later as the name for zero. The Sankheda Copper Plate having seemingly the earliest inscription of zero was found in Gujarat, India (585-586 C.E.) The more famous record of the Indian use of zero is dated 876 C.E.

In the 'Brahmā-Sphuta-Siddhānta' of Brahmagupta (7th Century C.E.,) the zero is explained and then passes into Arabic books around 770 C.E. and to Europe in the 8th century. However, the concept of zero is referred to as śūnya in the early Sanskrit texts of the 4th century B.C.E. and clearly explained in Piṅgala's Chandaḥ-Sūtra. What is more, I found it in a clear form expressed as 'void space' ('śūnya') on the Harappan numerical seals (see the last chapter.)

The designation of zero as a circle goes back to an ancient Indian mark of an aperture (emptiness.) The Sanskrit word 'śūnya' ('emptiness') in the Arabian pronunciation turned into 'sifr,' and in Roman one in 'cifra' (cipher.)

The mathematics in India was generated in a late Paleolithic Age and blossomed in the Vedic period (7th – 1st millennium B.C.E.), then it rises on new height during the classical period (from the 1st millennium B.C.E. – 1st millennium C. E.) and starts to produce appreciable influence on China and Europe in the Middle Ages (5th c. – 15th c.)

Hundreds of practical mathematical methods were developed in the Vedic period. One of them is, for example, *navaseś*, allowing checking more complex arithmetic operations with the help of more simple ones. An other method allows multiplying easily the numbers consisting of different units (for example, *foots* and *inches*.)

Brahmagupta described in detail negative numbers, which were not known to Egyptians and Babylonians. Sometimes, it is affirmed that Babylonians could solve systems of equations, though records of it was not kept, whereas in India, there are enough such evidences. Thus, they used letters for a designation of the unknown values named variables (the number of which reached sometimes ten or more.)

Hindus had a clear idea of infinity; Bhāskara asserted that three divided by zero equals infinity. That is almost correct in context of modern concepts.

Dr. David Gray in his research ‘Indic Mathematics: India and the Scientific Revolution’ points at the ethnocentric bias in mathematics, ‘which most often manifests not in explicit racism, but in a tendency toward undermining or eliding the real contributions made by non-Western civilizations.’

George Gheverghese Joseph, in an article entitled ‘Foundations of Eurocentrism in Mathematics,’ comes to the same conclusion that ‘the standard treatment of the history of non-European mathematics is a product of historiographic bias (conscious or otherwise) in the selection and interpretation of facts, which, as a consequence, results in ignoring, devaluing or distorting contributions arising outside European mathematical traditions.’

This has led, as Sabetai Unguru has argued, toward a tendency

to read more advanced mathematical concepts into the relatively simplistic geometrical formulations of Greek mathematicians such as Euclid, despite the fact that the Greeks lacked not only mathematic notation, but also even the place-value system of enumeration, without which advanced mathematical calculation is impossible. Such ethnocentric revisionist history resulted in the attribution of more advanced algebraic concepts, which were actually introduced to Europe over a millennium later by the Arabs, to the Greeks. And while the contributions of the Greeks to mathematics was quite significant, the tendency of some math historians to jump from the Greeks to renaissance Europe results not only in an ethnocentric history, but an inadequate history as well, one which fails to take into account the full history of the development of modern mathematics, which is by no means a purely European development.'

J. J . O'Connor and E. F. Robertson have described Jaina mathematics from the founding of Jainism up to modern times at least from the 5th century B.C.E. up to the 18th century C. E. One text entitled the 'Sthanānga Sūtra' from about the second century B.C.E. is particularly interesting in that it lists the topics, which made up the mathematics studied at the time: the theory of numbers, arithmetical operations, geometry, operations with fractions, simple equations, cubic equations, quadratic equations, and permutations and combinations.

They point at ideas of the mathematical infinite in Jaina mathematics, which evolved largely due to the Jaina's cosmological ideas. In Jaina cosmology time is thought of as eternal and without form. The world is infinite; it was never created and has always existed. Space pervades everything and is without form. All the objects of the universe exist in space, which is divided into the space of the universe and the space of the non-universe. There is a central region of the universe in which all living beings, including men, animals, gods and devils, live. Above this central region is the upper world, which is divided into two parts. Below the central region is the lower

world, which is divided into seven tiers. This led to the work on a mathematical topic in the Jaina work, Tiloya-Pannatti by Yativrsabha. A circle is divided by parallel lines into regions of prescribed widths. The lengths of the boundary chords and the areas of the regions are given, based on stated rules.

This cosmology has strongly influenced Jaina mathematics in many ways and has been a motivating factor in the development of mathematical ideas of the infinite which were not considered again until the time of Cantor. The Jaina cosmology contained a time period of 2^{588} years.

$2^{588} = 1013\ 065324\ 433836\ 171511\ 818326\ 096474\ 890383$
 $898005\ 918563\ 696288\ 002277\ 756507\ 034036\ 354527\ 929615$
 $978746\ 851512\ 277392\ 062160\ 962106\ 733983\ 191180\ 520452$
 $956027\ 069051\ 297354\ 415786\ 421338\ 721071\ 661056 = 10^{177}$.

They had different quite sophisticated infinite measures, which they did not define in a rigorous mathematical fashion. The first innumerable number was constructed using effectively a recursive construction. The whole procedure is repeated, yielding a truly huge number, which is called jaghanya-parita-asamkhyata meaning ‘innumerable of low enhanced order.’

Jaina mathematics recognized five different types of infinity: infinite in one direction, infinite in two directions, infinite in area, infinite everywhere and perpetually infinite.

The ‘Anuyoga Dwara Sūtra’ contains other remarkable numerical speculations by the Jainas. For example, several times in the work the number of human beings that ever existed is given as 2^{96} .

By the second century C.E., the Jainas had produced a theory of sets. In Satkhaṇḍāgama various sets are operated upon by logarithmic functions to base two, by squaring and extracting square roots, and by raising to finite or infinite powers. The operations are repeated to produce new sets.

Permutations and combinations are used in the ‘Sthanāṅga Sūtra.’ Interestingly here too there is the suggestion that the arithmetic

can be extended to various infinite numbers. In other works, the relation of the number of combinations to the coefficients occurring in the binomial expansion was noted. In a commentary on this third century work in the tenth century, Pascal's triangle appears in order to give the coefficients of the binomial expansion.

Another concept, which the Jainas seem to have gone at least some way towards understanding, was that of the logarithm. They had begun to understand the laws of indices. Some historians believe that they see evidence for the Jainas having developed logarithms to base 2.

The history has preserved some names of Indian mathematicians-astronomers. It is a short list of the most remarkable names.

Sanskrit Symbolical Programmers

Lāgadha

Pāṇini

Piṅgala

Baudhāyana

Apastamba

Kātyāyana

Sanskrit Astronomers

Umasvati (150 B.C.E.)

Āryabhaṭa (476-550 C. E.)

Varāhamihira (505-558)

Brahmagupta (598-670)

Govindaswami (800-850)

Mahāvīra (Mahāvīrācārya) (850)

Prithūdakaswāmi (850)

Shrīdhara (900)

Mañjula (930)

Āryabhaṭa II (950)

Praśastidhara (958)

Halāyudha (975)

Jayadeva (1000)

Shrīpati (1039)

Hemacandara Sūrī (b. 1089)
Bhāskara (1114-1185)
Caṅgadeva (1205)
Madhava from Sangamagrama (1340-1425)
Narāyana Pandit (1350)
Parameshvara (1360-1455)
Nilakantha Somayaji (1455-1555)
Shankara Variar (1500-1560)
Narāyana (1500-1575)
Jyeṣṭhadeva (1550)
Acyuta Pīsarathi (1550-1621)
Putumana Samayaji (1660-1740)
Jagannath Pandita (1700)
Shankara Varman (1800.)

Vedic Standard of Time Measurement

Really, the happiness is an infinite Universe. There is no happiness in limited space, only boundless cosmos is happiness. It is necessary to aspire to comprehend the infinity.

Chandogya-Upaniṣada, VII.23.1

Modern explorers treat the Vedas as monuments of the religious poetry of Aryans, nomads, who destructed the proto-Indian civilization either of Dravidians¹⁰⁶ or of Munda people.¹⁰⁷ The Vedas are esteemed to be pieces of high culture of the defeated peoples saved indiscriminately in memory of the conquerors.

¹⁰⁶ Asko Parpola, *Dicephering Indus Script*, Cambridge 1994; M. F. Albedil, B. Y. Volchok, Y. V. Knorozov, *Researches of the Proto-Indian encriptions*, In.: *Forgotten Writing Systems*, Moscow, 1982. P. 240-295; M. F. Albedil, *Proto-Indian Civilization: An Essay On Culture*, Moscow, 1994.

¹⁰⁷ M. Witzel, *Substrate Languages in Old Indo-Aryan (Rgvedic, Middle and Late Vedic)*. In: *Electronic Journal Of Vedic Studies*, Vol. 5 (1999), issue 1 (September).

This view fully applicable to the later Muslim period is as paradoxical, as biased, when applied to proto-Indian history. It is disputed by many Indian scholars such as, for example, historians A. C. Das, who believed, that the homeland of Aryans was situated between Indus and the sea which was in place of modern Gaṅgā,¹⁰⁸ and Budha Prakash, who revealed typological cultural similarity between proto-Indian and Vedic civilizations, mythologies and symbolical systems.¹⁰⁹

Budha Prakash, in particular, noted this similarity in numerical systems mirrored in material monuments of the proto-Indian epoch and in the Vedic documents. Everywhere a binary and decimal systems were used.¹¹⁰

Let us notice that the geometrical progression with a denominator two characterizes the binary code of Piṅgala!

Proportions of bricks of the Harappan cities are always independently of their sizes in ratio 4 : 2 : 1; main, wide and narrow streets are in the same proportions.

Precisely the same ratio is found in the Pancavimśa-Brāhmaṇa (18.3,) where each subsequent number is twice as big as the previous one.

Famed French scholar Georges Ifrah studied the mystery of the evolution of numbers and provided a huge collection of proofs from all disciplines, dating from the most significant eras, to establish his claim that numerals evolved from Indian Brahmi script (often called the ‘mother’ of all Indian writing systems. Then, Shaka, Kushana inscriptions followed, leading consecutively to Gupta style, Nagari style, Arabic from the ‘Gubar’ style, European late middle ages (cursive forms of the Algorithms) and modern.

¹⁰⁸ A. C. Das, Ṛgvedic India, Calcutta, 1921. P. 71.

¹⁰⁹ Buddha Prakash, Ṛgveda and the Indus Valley Civilization, Hoshiarpur, 1966.

¹¹⁰ Buddha Prakash, Opp. Cit., pp. 50-51.

Ifrah says that the ‘...real inventors of this fundamental discovery, which is no less important than such feats as the mastery of fire, the development of agriculture, or the invention of the wheel, writing or the steam engine, were the mathematicians and astronomers of the Indian civilization: scholars who, unlike the Greeks, were concerned with practical applications and who were motivated by a kind of passion for both numbers and numerical calculations.’

In the opinion of Michel Danino,¹¹¹ Proto-Indians indeed look as the first inventors of the decimal system.

It is testified by the system of weights, the system of linear measures and the system of time measurements. So, the ruler from Lothal has almost 30 divisions with step of 1.704 mm (about 50 sm) and width of a wall of the dock in Lothal is equal to 1.78 m (i.e. approximately 1000 times more.)

The scale of the weight units changing proportionally from 1 up to 12800, followed also a geometrical progression with a denominator 2. One of values with denomination 16 is equal to 13.7 grams, and the greatest weight unit (12800) is equal to 10865 grams, the correct being 10960 grams with the ‘error’ of only 0.9 %! But it was still organized as 4-order system, in which orders grew also according to a geometrical progression with a denominator 10:

Table 3.

Ratio of weight units in the Vedic India

Extra progression	Main progression							
	1	2	4	8	16	32	64	
*10					160	320	640	
*100	200				1600	3200	6400	12800
*1000				8000				

¹¹¹ Michel Danino, The Sindhu-Sarasvati Civilization and its Bearing on the Aryan Question: Text of a lecture given on 29 September 1999 at Chennai’s Indian Institute of Technology, (Internet publication).

Table 4.

Decimal place system

Places	Extra geometrical progression				Main progression
	4 th	3 rd	2 nd	1 st	
Etc.	*1000	*100	*10	*1,	
	0	0	0	0	0
	1000	100	10	1	1
	2000	200	20	2	2
	3000	300	30	3	3
	4000	400	40	4	4
	5000	500	50	5	5
	6000	600	60	6	6
	7000	700	70	7	7
	8000	800	80	8	8
	9000	900	90	9	9
Ex.:	1 (*1000)	+0 (*100)	+2 (*10)	+1 (*8)	= 1028

It is necessary to notice that it is the same place decimal system, which we use today with that only a difference that the basic progression represents not a geometrical with a denominator 2, but the arithmetic one with a denominator 1.

Besides, Proto-Indians used fractions, such as one third and multiples to it, as in the Vedas, where we find $\frac{1}{2}$ (ardha, a half;); $\frac{1}{3}$ (trīya, one third;); $\frac{1}{4}$ (pāda, a foot;); $\frac{1}{8}$ (śapha, a hoof;); and $\frac{1}{16}$ (kalā, a lunar phase.)

The calculation in tallies of ten is attested in all the Vedas. The Vajasaneyi-Saṁhitā (17.2 and further,) for example, gives the decimal progression up to a trillion.

The Life of Brahmā, which is described below, is just calculated in trillions. For comparison, ancient Greeks did not use at all numbers over ten thousand and carried out multiplication on an accounting board with the help of addition.

Table 5.

The Vedic decimal numbers

eka	1
daśa	10
śata	100
sahasra	1000
ayuta	10.000
niyuta	100.000
prayuta	1000.000
arbuda	10.000.000
nyarbuda	100.000.000
samudra	1000.000.000
madhya	10.000.000.000
anta	100.000.000.000
parārdha	1.000.000.000.000

The Kāṭha-Saṁhitā (39.6) contains the same list with that only difference that niyuta and prayuta interchanged places and one more number was inserted after nyarbuda, that increased the subsequent numbers 10 times.

The list of the Maitrāyanī-Saṁhitā (11.8.14) consists of ayuta, prayuta, ayuta, arbuda, nyarbuda, samudra, madhya, anta, parārdha.

The list of the Pancavimśa-Brāhmaṇa (17.14.2) coincides up to nyarbuda, and then go nikharvaka, badva, akṣita and go (1.000.000.000.000.)

The Jaiminiya-Upaniṣada-Brāhmaṇa (1.10.28-29) replaces the terms nikharvaka with a word nikharva, badva with padma, and places akṣiti and vyoma-anta (‘heavenly infinity’) at the end.

The Śaṅkhayana-Śrauta-Sūtra (16.11.7) places nikharvada, samudra, salila, antya and ananta (10^{12} or billion) places after nyarbuda.

The second section (anuvāka) of the Taittirīya Upaniṣada, which is a part of the Yajur Veda, is dedicated to a mathematical definition of the Bliss of Brahmā. It starts by assuming that a young, educated

man who possesses the Earth full of wealth, is one unit called ‘Human Bliss.’ The Upaniṣada provides a precise calculation of a series of multiplications by 100 till the number 100^{10} units of Human Bliss, when one attains Brahman. So the Bliss of Brahmā is equal to 10^{20} or 100 quintillion (USA) or 100 trillion (GB.) This system consists of ten numbers and strictly follows the geometrical progression with the denominator 100.

The highest serial prefix used for raising 10 to a power in today’s maths, for which there is a name in modern mathematics, is ‘Decillion’ (from Greek Deca) for 10^{33} . This system accepted in the USA, Canada, France and Russia is a geometrical progression with the denominator 1000.

Great Britain and Germany use a geometrical progression with the denominator 1,000,000 and names up to 10^{60} .

Therefore, a quintillion is a cardinal number represented in the U.S.A. by 1 followed by 18 zeros ($1000 * 1000^5$), and in Great Britain by 1 followed by 30 zeros ($10^{30} = 1000000^5$.)

The biggest number called Googol allegedly invented by the nine-year-old nephew of the U.S. mathematician Edward Kasner (1878 – 1955) and introduced by the latter in the 40-th is equal to 1 followed by 100 zeros and expressed as 10^{100} .

Ancient Vedic, Buddhist and Jaina mathematics used for the biggest numbers geometrical progressions with the denominators 10 and 100. Vedic system gave names up to 10^{20} . Buddhists proposed names up to 10^{53} . The Vedic and Buddhist systems reflect the American and English numerical dichotomy. The number’s line enumerated by Buddha up to 10^{53} was declared the first of 8 series alluding to a maximum number of 10^{421} ! The maximum numbers proposed by Jaina mathematicians is 10^{177} , much bigger than Googol. The maximum proposed by Vedic mathematicians is $10^{300} - 1$.

The comparative table shows you that ancient Indian system was more elaborate than the modern European one. It may be considered as an indication of its wider application for certain practical needs.

Table 6.

Names of ancient Indian numbers powers of 10 and 100 against modern European and American ones

	Indian	Value	France, USA, Canada, CIS	Great Britain, Germany
1.	ekam	1	One	
2.	daśakam	10	Ten	
3.	śatam	100	Hundred	
4.	sahasram	1000	Thousand	
5.	daśasahasram	10000	Ten Thousand	
6.	lakṣah	100000	Hundred thousand	
7.	daśalakṣah	10^6	Million	
8.	kotiḥ	10^7		
9.	ayutam	10^9	Billion	Milliard
10.	niyutam	10^{11}		
11.		10^{12}	Trillion	Billion
12.	kaṅkaram	10^{13}		
13.	vivaram	10^{15}	Quadrillion	
14.	parārdhaḥ	10^{17}		
15.		10^{18}	Quintillion	Trillion
16.	nivahaha	10^{19}		
	Bliss of Brahmā	10^{20}	100 Quintillion	
17.	utsaṅgaha	10^{21}	Sextillion	
18.	bahulam	10^{23}		
19.		10^{24}	Septillion	Quadrillion
20.	nagbalaha	10^{25}		
21.	titilambam	10^{27}	Octillion	
22.	Vyavasthana-prāgnaptiḥ	10^{29}		
23.		10^{30}	Nonillion	Quintillion
24.	hetuhīlam	10^{31}		
25.	karahūhu	10^{33}	Decillion	

26.	hetvindhriyam	10^{35}	
27.		10^{36}	Sextillion
28.	samapta-lambhaḥ	10^{37}	
29.	ganaganatiḥ	10^{39}	
30.	niravadyam	10^{41}	
31.		10^{42}	Septillion
32.	mudrabalam	10^{43}	
33.	sarvabalam	10^{45}	
34.	viśamāgnagatiḥ	10^{47}	
35.		10^{48}	Octillion
36.	sarvāgnah	10^{49}	
37.	vibhutāngama	10^{51}	
38.	tallakṣanam	10^{53}	
39.		10^{54}	Nonillion
40.		10^{60}	Decillion
41.		10^{100}	Googol
42.	Jain maximum	10^{177}	
43.	Vedic maximum	$10^{300} - 1$	
44.	Buddhist maximum	10^{421}	

Where and for what purposes could this elaborate numerical system have been applied?

As J. Filliozat notes, the Vedas, undoubtedly, represent the important stage in development of the ability of Brahmanas to cope with numbers up to trillions frequently containing several digits after a decimal point and to build sine tables.

Take into account that the Vedic texts define sizes smaller than an elementary particle and time units making one tenth, one hundredth, one thousandth, one hundred-thousandth, one ten-millionth and even one ten-trillionth of a second. Astronomical calculations reach trillions and higher values (the size of gāyatṛ allowing to express numbers up to $2^{26} - 1$ in a binary code, as it will be shown in the chapter about a binary code in the Part II, is the smallest meter in the Ṛg-Veda.) Proto-Indians created the ideal scale of measures

beginning from a geometrical point or elementary particle (param-aṇu, ‘the supreme particle’) or from any minimal unit of one of the ideal astronomical time scales spreading to infinity.

O. Neugebauer remind us about Tamil Brahmanas who had kept in memory till the XXth century the lunar and solar tables containing many thousand of numbers, similar to what were used by Babylonians and Greeks in the Seleucid period, and had been making long calculations with the numbers reaching trillions in the whole part and up to several digits in fractional part for definition of the dimension, duration, beginning and end of eclipses.¹¹² Moreover, he recognizes that the Indian method, though coincides amazingly with the Babylonian and Greek ones, nevertheless, differs from them by additional procedures.

Any figure or number depending on an occupied position in any formula or expression in binary, ternary and any other similar notation can give different numerical values, as in our decimal system.

Symbols or functions qualifying the number change the value of this number.

For example, the n-factorial is a product of consecutive natural numbers from one up to n: $n! = 1 \cdot 2 \cdot 3 \cdot \dots \cdot n$.

Here are some more examples, in which the number n with various modifiers accepts different values, which are generally distinct from the number n. If to consider a natural degree of number, it appears that ‘n’ here is equal to: $n_k = n \cdot n \cdot \dots \cdot n$ (k multipliers of n.)

Root of a degree k from a number n - $\sqrt[k]{n}$ is such a number x, which in a degree k gives $n = x^k$.

The logarithm of a number n on the basis a $\log_a n$ points at that the number ‘n’ is an exponent, to which it is necessary to raise the basis a in order to get the number n.

The binary, ternary and decimal systems having nowadays a

¹¹² Neugebauer O. The Exact Sciences... Opp.Cit. Moscow, 1968. P. 164-165.

wide circulation represent examples of a digital polysemy. Value of the extreme digit at the left in the decimal number '40' is determined by the formula: $4 = 10 * 4 = 40$.

We equate here the zero to multiplier 10^n .

If to mean that the zero in a decimal notation specifies absence of a figure in a certain position and is used for marking of void positions, then the number '40' in a nonary system, during the epoch before the invention of zero and place system, could be written down most laconically as: $9 * 4 + 4$.

That is '4' in the 2nd position of decimal system means the number equal to $9 * 4 + 4$. In a general form, the formula $9 * n + n$ was consciously or unconsciously used for designations of tens up to 100.

More bulky was representation of numbers from 100 up to 900. For example, $400 = 4 * 99 + 4$. However, as '99' itself is a place number, it should be arithmetically understood as $(9 * 9 + 9) + 9$, if not to recur to zero as a mark of place system.

Thus, $400 = (9 * 9 + 9 + 9) * 4 + 4$.

Alternatively: $400 = 9 * (9 * 4 + 4) + (9 * 4 + 4)$.

Shifting the figure n one place to the left demands the chunk x in the right part of the last equation to be multiplied by 9 and to be added to the product (that is equivalent to multiplication by 10.) For n thousand, the equation gets the following form:

$$n000 = 9 * [9 * (n * 9 + n) + (n * 9 + n)] + [9 * (n * 9 + n) + (n * 9 + n)].$$

(Here n is a figure, i.e. 1,2,3... 9.)

The same process occurs at each following shift on the category to the left.

$$n0000 = x * 9 + x,$$

$$\text{Where } x = 9 * [9 * (n * 9 + n) + (n * 9 + n)] + [9 * (n * 9 + n) + (n * 9 + n)].$$

With intent to look into that epoch, which had preceded the birth of decimal system, Nathalie Mikhailov has analyzed once again that

mathematics, which could have been at the base of the place system and big Vedic numbers before invention of zero.

Nine planets have created concept of nine initial tallies, numerical symbols or figures. Initially, the number greater than 9 should have been written as the sum $9 + n$. For example, $10 = 9 + 1$.

Eventually, a necessity to reduce record led to multiplication. For example, '100' in a nonary system is written as:

$$9 * 9 + 9 + 9 + 1 = 9 * 9 + 2 * 9 + 1.$$

In numbers '1000' and higher, the chains of 'nine-factors' are emerging:

$$1000 = 9*9*9+9*9+9*9+9+9*9+9+9+1 = 9*9*9+3*9*9+3*9+1;$$

$$10,000 = 9*9*9*9 + 9*9*9*3 + 9*9*3+9 + (9*9*9+9*9*3+9*3+1) = \\ = 9*9*9*9 + 4*9*9*9 + 6*9*9 + 4*9 + 1.$$

It should have generated attempts to write down these numbers with the help of the concept of a degree and binomial coefficients, which – as we now understand – had been not casually systematized in the ordered table 'Meru-prastāra' of Piṅgala (see ch. 'About a binary code' in the second part, section 'Meru prastāra,') constructed as a multilevel pyramid:

$10^k = 9^k + c_k^1 \cdot 9^{k-1} + c_k^2 \cdot 9^{k-2} + c_k^3 \cdot 9^{k-3} + \dots + c_k^{k-2} \cdot 9^2 + c_k^{k-1} \cdot 9 + 1$, where c_k^m are binomial coefficients, i.e. numbers of combinations from k per m .

Then, for example,

$$n00000 = n \cdot (9^5 + c_5^1 \cdot 9^4 + c_5^2 \cdot 9^3 + c_5^3 \cdot 9^2 + \\ + c_5^4 \cdot 9 + 1) = n \cdot (9^5 + 5 \cdot 9^4 + 10 \cdot 9^3 + 5 \cdot 9^2 + 9 + 1)$$

Whatever graceful the given record might have seemed, it was not convenient at all for application in the astronomical formulae involving big numbers. The answer to this difficulty was the place decimal system, which had been born not from the dactylology or dactylonomy, but from the necessity to simplify operations with big astronomical figures based on 9. Mathematically, astronomically, linguistically, psychologically and economically Proto-Indian civilization was quite ready to solve that complex problem.

Table 7.

Ternary and decimal prastāras

Ternary code				=	Decimal code				=
	9*	3*	1*		1000*	100*	10*	1*	
1	0	0	0	0	0	0	0	0	0
2	0	0	1	1	0	0	0	1	1
3	0	0	2	2	0	0	0	2	2
4	0	1	0	3	0	0	0	3	3
5	0	1	1	4	0	0	0	4	4
6	0	1	2	5	0	0	0	5	5
7	0	2	0	6	0	0	0	6	6
8	0	2	1	7	0	0	0	7	7
9	0	2	2	8	0	0	0	8	8
10	1	0	0	9	0	0	0	9	9
11	1	0	1	10	0	0	1	0	10
12	1	0	2	11	0	0	1	1	11
13	1	1	0	12	0	0	1	2	12
14	1	1	1	13	0	0	1	3	13
15	1	1	2	14	0	0	1	4	14
16	1	2	0	15	0	0	1	5	15
17	1	2	1	16	0	0	1	6	16
18	1	2	2	17	0	0	1	7	17
19	2	0	0	18	0	0	1	8	18
20	2	0	1	19	0	0	1	9	19
21	2	0	2	20	0	0	2	0	20
22	2	1	0	21	1	0	2	8	1028

Probably, ideal prastāras or matrixes of binary and ternary codes had been developed and then, on their sample, a decimal system had evolved. The prastara of decimal numbers was reflected in the Proto-Indian system of weights as it has been shown above. The prastara of binary numbers is given in the eighth chapter of the Piṅgala's Chandaḥ-Śāstra (see ch. on a binary code.)

Measurement of Space

The smallest spatial particle (paramāṇu) in the Vedic physics vaiśeṣika has the size of 10^{-17} mm.

It is less than the size of the smallest particle known to the modern quantum physics. The size of electron today is defined as 10^{-8} mm, and the sizes of the elementary particles got on accelerators change from 10^{-12} up to 10^{-15} mm. Thus, for intervals $10^{-14} - 10^{-15}$ mm space can be regarded as continuous.

In Sanskrit astronomical treatises, there are also other definitions of paramāṇu: for example, $5 * 10^{-7}$ mm (the 'Śārdūla-Karṇa-Avadāna' and the 'Divya-avadāna,') $1.43 * 10^{-6}$ mm (the 'Sūrya-siddhānta') that is close to the size of electron.

It is curious to note that, in these definitions, for the sizes less than 1mm, geometrical progressions with a denominator 7 (the 'Śārdūla-Karṇa-Avadāna' and the 'Divya-avadāna,') and 8 (the 'Sūrya-siddhānta') up to values 7^9 and 8^7 were used. It reminds us the 8 orders of big numbers of Buddha and the approach of the creators of the binary code.

Moreover, as Vidyāvācaspati notices, the meters are constructed according to the same principle of doubling, which is applied to the description of elementary particles (paramāṇus,) atoms (trasareṇus,) etc.¹¹³

Five kinds of the Vedic syllabic meters being versions of binary codes, named varṇa-, akṣara-, pāda-, vākya- and prakaraṇa-chandas, correspond according to the Vedic tradition to the five physical elements: ākāśa (field,) vāyu (gas,) tejas (plasma,) apas (liquid) and pṛthivī (solid state.)¹¹⁴ The same elements besides designating modular conditions of matter are also symbols of divisions of the zodiac. It

¹¹³ Madhusūdana Vidyāvācaspati, Chandonirukti. In: Śrī Piṅgalanāga, The Chandas Śāstra, 1938. P. 51.

¹¹⁴ Madhusūdana Vidyāvācaspati, Op. Cit., p. 51.

is possible that the meters and the binary codes related to them could have been used for spatial measurements as well.

Science of Metrics and Coding (Chandaḥ-Sāstram)

*Parokṣa-priyaḥ iva hi devaḥ, pratyakṣa-dviṣaḥ.
Devas (luminaries) like symbolism
and hate eyewitness account.*

Bṛhad-Āraṇyaka-Upaniṣadaḥ, IV, 2.2

Chandaḥ is the designation of the science of prosody as well as of the language of the Vedic hymns. Its symbolical author is Piṅgala. His work written also in the algebraic style like the grammar of Pāṇini was later supplemented with a large number of commentaries by Halāyudha and others and medieval metrical works of Kṣemendra, Hemacandra and others. The main subject of this work is the description of the binary code applied to the Vedic (sacred) and Laukika (secular) metrics.¹¹⁵

In Europe, the binary code was first discovered by the German philosopher, writer and mathematician Gottfried Wilhelm von Leibniz (1646-1716,) who could not find any application for it and considered it a divine revelation.

From the end of the XIXth century scholars began to notice binary character of the Piṅgala's systematization. They noted that the metric system of Piṅgala had mathematical character for it described arrays of the meters through degrees of two and contribution of Piṅgala to binary system was quite phenomenal.

V. S. Apte in a sketch of Sanskrit prosody (see the appendix to his 'Student's Sanskrit-English Dictionary') emphasized that meters were classified according to quantity of syllables and the order of long and short syllables in a pada. He specified, for example, that the

¹¹⁵ Mikhailov M. and Mikhailova N.: The Key to the Vedas: Ancient Indian Metrics as the System of Algebraic Binary Encoding. Minsk-Vilnjus, 2001 (in Russian.)

quantity of possible combinations in a meter consisting of six syllables whereas each syllable can be long or short is defined according to the formula: $2*2*2*2*2*2 = 2^6 = 64$.

In case of the meter consisting of 26 syllables, the quantity of possible combinations will be 2^{26} or 87108864! If to take into account that feet in a stanza can be not only identical, but also different the quantity of combinations becomes almost infinite. He also paid attention to that Piṅgala, the last chapter of a medieval Sanskrit treatise 'Vṛtti-Ratnākara' ('The Ocean of Meters') as well as a mathematical work 'Līlīvatī' gives rules of calculation of syllable combinations and definition of their serial number.

Nevertheless, Apte has not seen the pure mathematical character of Sanskrit metrics. He simply ascertained that the huge quantity of the meters which is used in the Sanskrit literature, is just a drop in the sea of possible combinations.

Navjyoti Singh has pointed at Pascal's Triangle of coefficients of Binomial expansion constructed by Halayudha in his commentary on the Chandaḥ-Śāstram.¹¹⁶

The binary code and Pascal triangle, has been rediscovered in the work of Piṅgala by Barend van Nooten (1993) from the Californian University, but he identified them as the procedures developed for classification, description and analysis of the meters.¹¹⁷

B. Nooten wrongly believed that the system of binary numbers begins with the serial number 'one' (instead of zero,) and numerical value can be get by subtraction of one from a serial value. Though he is extremely close to truth, I shall be bold to disagree with his emphasis on the primary importance of serial numbers. Piṅgala as you will see

¹¹⁶ Singh, Navjyoti, Linguistics and Oral Tradition in the Period Between the Decline of Harappan Culture and the Rise of Magadhan Culture. In: Chattopadhyaya D., Opp. Cit., pp. 406-453. – P. 422.

¹¹⁷ Nooten, B. van, Binary Numbers in Indian Antiquity, Journal of Indian Studies, Volume 21, 1993, pp. 31-50.

in the chapter on binary code, defined two series of numbers: quantitative and serial. The first series lists all metric variations, the other one gives exact decimal values of the variations according to exact Vedic algorithm or rule of adhva-yoga formulated by Piṅgala, who establishes strict conformity between binary and decimal numbers. B. Nooten, S. Kak as well as others have not understood properly this rule, as they believed that these syllabic binary numbers were used only for enumeration and classification of the meters.

However, according to our view, the purport of these algorithms had not been a pedantic enumeration of billions of syllabic meters and determination of their serial order, but in reality, they had represented an algebraic binary code developed by means of Vedic Sanskrit, a perfect programming language of antiquity, for encoding large decimal numbers.

The binary code was outlined in algebraic form in the VIIIth chapter of the Chandah-Śāstraṃ of Piṅgala, which was the important algebraic Vedic ‘Science of encoding and metrics.’ ‘Chandah,’ according to Vedic etymology, means ‘covering,’ ‘hiding’ or ‘concealing.’ At the same time, it means ‘Vedas’ and ‘Vedic language,’ according to ‘Nirukta’ and Pāṇini.¹¹⁸

One of the algorithms, so-called prastāra, explains how ordinal numbers can be transformed into binary-syllabic encoding and a table of all modifications of a particular meter or table of binary figures for a particular number of bites can be logically constructed. The other algorithm or Vedic rule of adhva-yoga establishes a strict identity between binary and decimal numbers. The Vedic mantras, which are treated predominantly as poetic stanzas or magic spells of incoherent, sometimes obscure mythological nature, now with the aid of computer, have been read as digital formulas.

¹¹⁸ Ananta Yajñeśvara Śarmā, ‘Prastāvanā.’ In: Śrī Piṅgala-Nāga, The Chandas Śāstra with the Commentary Mṛtasañjīvanī by Śrī Halāyudha Bhaṭṭa and with the Chandonirukti by Samikṣacakraṃvartī Śrī Madhusūdana Vidyāvācaspati, (Kāvya-amālā, 91), Bombay, 1938. Pp. 4–5.

My daughter Nadezhda has suggested me the method how to input syllabic meters into a computer table processor and automatically transform them into decimal numbers. We have already published a book in Russian, in which we have given the translation and explanation of the relevant sūtras of Piṅgala, some examples of decoded mantras and defined the new original method of astronomical-mathematical interpretation of the Vedic mantras regarding them as collections of scientific formulas. Therefore, our method consists in straightforward application to the Vedic hermeneutics of the mathematical procedures or algorithms (prastāra and others) described in the 8th chapter of the Chandaḥ-Śāstraṃ of Piṅgala.

The developing of this code in a vedāṅga treatise, presumably, was necessitated by the encoding and subsequent preservation in memory of large astronomical tables needed for mathematical astronomy of jyotiḥ-śāstra and calendrical ritual of kalpa-sūtras. According to our theory, the Vedas codified in the 7th millenary B.C.E. astronomical observations of the most remote antiquity. Namely, this scientific feature made the Vedas the true core of spiritual life and social unification of the greatest state of hoary antiquity.

The Chandaḥ-Śāstra is one of the six vedāṅgas, a basic discipline indispensable for exact comprehension of the text of the Veda-Saṃhitās, which are represented by metric expressions, organized in groups and sections, similarly to astronomical tables.

It is erroneously considered a manual on metrics. For the first time, the word ‘chandaḥ’ is met in the Ṛg-Veda itself. The Vedic proverb proclaims meters to be the legs of the Veda. Chandasiya is, really, a person expert in meters, and chandasika or chāndasaḥ is a person expert in Vedas.

Etymologically, the word chandaḥ comes from the root chad with the meaning to ‘hide’ and means a ‘cover’ or ‘coverage’ (Niruktā, 7.12,) that is, code. Quite often, it is asserted that devas (celestial luminaries) hide themselves under a cover of chandas. Therefore, the chandaḥ-śāstra is a science of encoding, the key to the Vedas

and to the Vedic speech!

It represents in reality a section of ancient Indian algebra, which main function was the description of a binary code indispensable not for the perfecting of poetics, but for exact encoding by means of metrics of large numerals. The central notions of the theory of the chandaḥ-śāstra are bīja (‘grain’ or logical core of binary calculation) and gaṇa (combination of syllables-bites.) Indian algebra, characteristically, is called bīja-gaṇita (symbolic-logical calculus) and the treatises of Āryabhaṭa, Bhāskara and others include invariably a chapter on the Vedic meters.

Syllabic meters, as it is known, are based on orderliness of number of syllables in a verse. It is important to note, that mātrā-chandas (‘the measured meters,’) popular in secular poetry, are not used in the Vedas, as quantity of vowels’ length is contradictory to the quantity of syllables (akṣaras.) Namely, the quantity of syllables is determining in Vedic meters. It is strictly established for all the Veda-Saṃhitās.

According to Piṅgala, chandaḥ represents a syllabic code based on a binary notation with a variable number of digits from 1 up to 106 (in exceptional cases even more.) The values of bites increase in geometrical progression with a denominator 2, representing powers of 2, starting from 1 ad infinitum from left to right (as against a modern record of binary numbers, in which one, as well as in other notations, the increase of bites goes from right to left.) If to esteem syllables, for the meter consisting of k syllables, the maximum number will be expressed by the formula: $2^k - 1$.

The maximum number (x,) which is represented by n-triadic prastāra, is determined according to the formula:

$$\begin{aligned} x &= 7 + 7 * 8^1 + 7 * 8^2 + \dots + 7 * 8^{n-1} = \\ &= 7 * (1 + 8^1 + 8^2 + \dots + 8^{n-1}) = 7 * \frac{8^n - 1}{7} = 8^n - 1. \end{aligned}$$

In an algebraic presentation, any binary number can be shown as follows:

$$y = x^1 + (x^2 * 8) + (x^3 * 8^2) + \dots + x^n * 8^n - 1,$$

where each x_i represents number assigned to a triad, standing on an i^{th} place from the left. This number can be from 0 up to 7.

In Sanskrit literature there are meters, really, consisting of 999 syllables. The maximum number assigned to such meter looks like $2^{999} - 1$ or equals to

$$5.3575430359313366047421252453 * 10^{300} - 1.$$

It is known, that both in ancient India, and in Europe up to late Middle Ages, astronomers originally used instead of sinuses half-chords of the angles in a circle, which depended on the length of the radius. So, Regiomontanus from Königsberg composed a table of sinuses with an interval of one minute, taking the radius equal to 60000 in order to achieve greater accuracy and not to deal with fractions. This number involuntarily reminds 60000 cows of the R̥g-Veda and the myth about 60000 sons of Sagara (the Full Moon,) which were sent to find a horse, 'the Moon,' gone to Kapila, the Sun.

In auxiliary Vedic literature, we meet more than once calculations of calendar cycles made in fractions of a second and representing huge numbers!

Advantages of an algebraic binary-octal system offered by Piṅgala are indisputable in the field of astronomical calculus requiring great accuracy and handling of extra-large numbers without the reference to composite fractions. The extra-large numbers encoded by dozens of syllables up to 106-bites foreseen in this system can be expressed by a poetic stanzas consisting of several poetic lines.

In this context, the chandaḥ-śāstra appears as the science of a perfect metacode organized on the basis of the theory of sets, progressions, combinatorial analysis, theory of infinitesimal and indefinitely large numbers, which allows to combine number and different levels of meaning, to be exact, different systems of calculation and astronomical information encoded in digital form.

It is necessary to note a serious distortion in Russian indology, namely absence of translations of such basic works as grammar of

Pāṇini and metrics of Piṅgala. V. G. Erman in his ‘Historical Sketch of the Vedic Literature’ (M., 1980) does not mention at all the Piṅgala’s work! T. J. Elizarenkova supplied her translation of the Ṛg-Veda with a brief note about the Vedic meters and devoted a chapter on Vedic metrics and phonetics in the book ‘The Language and Style of the Vedic Ṛṣis,’¹¹⁹ however, she described the meters not as a system of codes, but fragmentarily and, more likely, along the lines of the European academic approaches, than Sanskrit tradition.¹²⁰ Piṅgala was also not mentioned!

Some authors have sporadic and avaricious references to the work of Piṅgala without any internal analysis. So, V. K. Shokhin only noted compactness of the organization of the scientific treatise from the scientific-methodological point of view, a maturity of the axiomatic statements at the level of propositions and terms from ‘not checked’ metaprinciples to their logic consequences. However, he wrongly defined the content of the last and major chapter as the description of the rare meters (see the chapter on the binary code containing translation of this chapter.) Other authors sometimes mention Piṅgala or his classification of meters, enumerating the Vedic disciplines. The significance of Pingala’s work is immensely higher.

Theory of sets and classification of the Vedic Meters

The classification of the Vedic meters or binary codes follows the same mathematical patterns as the doctrine of prastāra. Apparently, it is carried out within the framework of the uniform approach and, most likely, presupposes a highly developed theory of sets.

¹¹⁹ Elizarenkova T. Y. *Yazik I Stil Vediyskih Rishi* (Language and Style of the Vedic Rishis). Moscow, 1993. P. 108-153.

¹²⁰ Elizarenkova T. Y. *Rigveda: The great beginning*. In: *Rigveda. I-IV Mandalas*. Translated into Russian by T. Y. Elizarenkova. Moscow, 1989. Pp. 531-537.

In the open association of sets of the Vedic meters represented by *br̥hat-chandas*, *ati-chandas*, *kṛti-chandas* and other less common forms, each member of a specific closed subset is subdivided into closed subsets of its groups (*gāyatrī* and others,) each group bursts into closed set of related subgroups (*ārṣī* and others,) and each subgroup forms the closed subset of modifications (as, for example, 64 modifications of 6-syllable *gāyatrī*.)

This ancient classification of the meters based on a developed combinatorial analysis and theory of sets is one of the outstanding achievements of the ancient Indian civilization and should impress favourably both the mathematician-astronomer and the specialist in metrics. But what is even more important, it opens a new door into unknown world of exact science in the Vedas.

In the light of all these discoveries, the fact that Piṅgala used a precise and detailed classification of the binary codes, at least, two thousand years ago, is not only mysterious, but intriguing as well. We do not put in a claim for the Vedas being a digital message from space or merely a great soar of fancy of a great ancient civilization. However, it is nice to be fully aware of the opportunities the efficient use of the code gives for the astronomical perusal of all ancient Vedic sacred literature and the history of programming and mathematics.

Meters and Astronomy

- *How to convict the emperor Soma-Moon of coming?*
- *With the help of chandas (Vedic verses-cryptograms.)*

Aitareya-Brāhmaṇa, 13.1.

Each of seven great meters is dedicated to a definite devatā (lunar godhood or phase situated in a definite lunar asterism) and is related with a definite clan of ṛṣis (seers-years.) The Brāhmaṇas indicate also (that is for us rather significant) conformity not only with the Vedic rites, but also with lunar days, levels of the devas and their celestial wives, lokas (locations of the moon,) time of the day, months, seasons of the year, days of the equinox.

Of particular interest are correlations of the meters with lunar fortnights, definite days of lunar month and year.

Having supposed an isomorphism between two sets of numbers, namely, of the total numbers of syllables, mantras, hymns and other subdivisions of the text and the number of trutis, muhūrtas, days in certain calendrical periods, I have found astonishing and precise isomorphism throughout the four Vedas. Along the lines just stated, I suggest we start the new project of translating the Vedas into digital form treating it as an astronomical table.

It is necessary to note, that there is nothing impossible in such a perfect recital calendar in that epoch: the planetary calendars are certified not only in Chinese, Sumerian, Egyptian, Biblical, Iranian, Slav, Ancient Greek and Roman calendrical-mythological traditions, but they are attested in pre-Columbian America, and even in Paleolithic Age, some tens millenaries ago.

We have decoded the first five hymns of the R̥g-Veda. The mantras, read as binary codes, give very large numbers up to 16 Millions. They are not contradictory to the spirit of the Vedic texts. The R̥g-Veda mentions decimal numbers up to trillion. Such numbers are met in Buddhist and Jaina texts.

We have noticed in accordance with our calendrical theory that these 50 numbers form three groups consisting of 15-16 elements each as if forming fortnights and disclosing the connection between everyday planetary or lunar observations and mantras. The deciphered numbers of the first group change in limits from 14 up to 16 millions, the second group represents fierce fluctuations sometimes lowering down to 10 – 5 millions, and in one case even to several hundred thousands. The third group follows the pattern of the first one and finishes with large fluctuations.

Then, having got a confirmation of the mantra-day association, we have analyzed all quantities of mantras indicated in Vedic anukra-man̥ṣis and discovered their amazing connection with the synodical and sidereal periods of all main planets.

For example, it is stated that the number of verses in the Atharva-Veda is 5977. It is in perfect coordination with the sidereal period of Mercury (87.99 day,) which is pronounced the governor of this veda-saṃhitā: $87.9 * 68 = 5977$.

Moreover, we have found that all the other saṃhitās have similar relations with their respective planetary deities. Therefore, the mantras of the four Vedas could be used as the diurnal timer, lunar-solar calendar as well as astronomical tables of Venus, Mars, Jupiter, Saturn, nodes of the lunar orbit, the full Moon and the Sun in their diurnal and annual circulation round the 28 nakṣatras and 28 upanakṣatras.

Our discovery of the strict conformity between metric expressions and decimal numbers points namely at the mathematical nature of the Vedic metrics and puts a task of the analysis of the mathematical content of the Vedic mantras along the lines of binary decoding.

Sāhitya-Śāstra or Literary Theory

Sāhityaśāstra embraces the themes studied by aesthetics, poetics, hermeneutics and even philosophy of language. It formulates a theory of poetry and gives its definition along with description of its merits and demerits. The theory of pathos or aesthetic experiences ('rasa-śāstra,') the nature of figurativeness (vakrokti-śāstra) and harmony or propriety (aucitya-śāstra) are carefully analysed and defined. Special attention is given to the determination of poetic figures (alaṅkāra-śāstra,) to the doctrine of implication or poetical suggestion (dhvani-śāstra) and to the examination of poetical styles (rīti-śāstra.) Literary theory includes also a canon of dramatic art (nāṭya-śāstra) and a classification of heroes and heroines.

The philosophical significance of sāhityaśāstra is determined by that it is based on inner logic of feelings and emotions. Characteristically, Brahman (the universal spirit) in vedānta philosophy is determined as rasa (aesthetic impression or emotion.)

The Nāṭya-Śāstra-Veda is a grand treatise on dramaturgy, em-

bracing the theory of literature, acting, dancing, music, architecture, aesthetics and psychology of art, being considered the fifth Veda.

It is curious, that the number of poetic implied meanings ('dhvanis,') according to the text Dhvanyāloka ('Elucidation of Dhvani,') is equal to 10455. It is only 13 more than the edition of the Ṛg-Veda consisting of 10442 mantras. The question naturally suggests itself whether the postulated quantity of dhvanis was consciously adjusted in conformity with quantity of mantras of the Ṛg-Veda thus specifying the special latent sense of each mantra! After it had been found out that, really, each mantra had a unique bouquet of mathematical-astronomical senses ciphered in several codes simultaneously and applicable in several contexts to different planetary periods, it became clear that the value of this and other similar 'literary' principles lays not so much in exotic literary criticism, as in chronometric programming.

The Doctrine of Aucitya or Poetic Harmony

The main distinctive feature of the Vedic syncretic spiritual tradition, as well as of ethics, aesthetics, literature and science is the principle of aucitya formulated by Kṣemendra speaking about all-round connectivity, internal compatibility, artistic interlinking of statements, relevance of any images, grammatical forms and dramatic situations. Aucitya for Kṣemendra is a normalness, genuineness, reliability and conformity of parts of a work to the whole design, competence of a writer, and relevance, timeliness, correctness and harmonious correlation of all artistic and logic means to the ordinance of composition. Besides, aucitya in Kṣemendra's views assumes not only the artistic and grammatical accuracy and correctness, but also aspiration to display life in its true dimension, comprehensively, in deep contradictions and variety so that leaning on centuries-ancient life experience of the people (loka-acāra-parijñāna,) it would be possible to warn the future generations against mistakes of ancestors.

17. ASTRONOMICAL INTERPRETATION

The method based on the analysis of digital ordonnance of the Vedic texts in strictly calendrical perspective being the most promising has been hindered by some objective factors. The first is a false historical perspective. Scholars often skip the fact that the source of the Vedic mathematics is found in the Vedic mantras themselves, in which not only examples of arithmetic operations, decimal progressions and even multiplying of matrixes are given explicitly,¹²¹ but also much more complex numerical information is encoded.

Second is a poor level of scrutiny of many departments of ancient exact science. Though the origin of a decimal system is recognized to be ancient Indian, the other systems of calculus designed, probably, even earlier have remained less studied and less known, though the historians of mathematics already noted, for example, that the astronomical treatises contain tables of sines in the poetic form with digits expressed by words meaning ordinary objects, i.e. by a special code. These words are met across Vedic texts as well.

By the way, the last circumstance indicates that the invention of such a refined lexical code has been preceded, doubtlessly, by a long preparatory period, and that the exact knowledge was occasionally encoded and enciphered by means of 'ordinary' spoken Sanskrit! Later, in the Middle Ages, the grammatical means were used for coding of large numbers by the astronomers and as logical quantifiers by creators of the Indian formal logics *navya-nyāya*.¹²²

Moreover, sometimes texts with scientific and mathematical content are found among compositions, which have, apparently,

¹²¹ Vijayendra Kumar, 'Laws of modern mathematics in Yajurveda.' In: Sciences and the Vedas, Bombay, 1984, pp. 55-61.

¹²² D. Ingalls, Materials... Opp.Cit.

religious purport. So, the texts relating to kalpa-vedānga, include śulva-sūtras (geometrical treatises) depicting construction of fiery altars of diverse shape and architecture. The grammar of Pāṇini and the Chandaḥ-Śāstra of Piṅgala are written in algebraic code!

A special chronological philosophy including clock, calendar and astronomical tables was indispensable for harmonic operation of the complex social-economic system of the Vedic Empire. In fact, an original philosophy of time (kāla-vāda) is preserved in such texts as the Mahābhārata, the Dharma-Śāstras, the Purāṇas and astronomical siddhāntas.

However, until recently, it was generally believed, that Vedic astronomy was not based on the use of astronomical tables and accurate clock, though it had elaborated a system of fine time units and a planetary calendar, with a complex system of intercalation.¹²³

This view is rather characteristic for all western Indology. Kim Plofker arguing against Narahari B. Achar's hypothesis of the Vedic gods being symbols of the nakṣatras emphasizes the absence of unambiguous and detailed attestations of an astronomy sufficiently developed and says: 'Where is the explicitly-quantitative-astronomy his conclusions appear to assume, where are the units of measurement, the standardized reference systems, the observational records, the descriptions of observational practices, the refinements of calendrical computation? If one reads all the astronomical references in Vedic texts 'loosely,' that is, without requiring them to conform to precise technical meanings, they form a consistent and reasonable (though sketchy) picture of a minimal astronomy concerned mostly with the regulation of a simple lunar-solar liturgical calendar, and taking note of other celestial features such as constellations and eclipses without attempting any predictive mathematical schemes concerning them – a picture very like the one we have of late second-millennium Mesopotamian or early first-millennium Greek astronomy. It does

¹²³ Subhash Kak, *Astronomical Code of the Rig-Veda*, New Delhi, 1994, p. 15.

not challenge in any way the conservative chronology for the Vedic period maintained by most Indologists on the basis of linguistic and archaeological evidence.’¹²⁴

Elena P. Blavatsky

E. Blavatsky (1831-1891) traveled across India and Tibet, and then became the foundress of theosophy and the Theosophical society (New York, 1875,) which headquarters is nowadays in Madras. Her main works are ‘Exposed Isis’ and ‘The Secret Doctrine: Synthesis of Science, Religion and Philosophy’ in two weighty volumes, translated by Elena Roerich and issued in Riga in 1937. In Russia, this work was published only in the year 1991, which was proclaimed by UNESCO the Year of Memory of Elena Petrovna Blavatsky. The word ‘religion,’ which appeared in the title of her main work, predetermined intransigent attitude to Blavatsky on the part of the Soviet censorship during all Soviet period. She was enrolled in black list of occultists, workers of Imperial Intelligence Service and charlatans. Remarkable research appeared dead more than hundred years.

Nevertheless, pathos and importance of her pioneering work consisted in reconstruction of the science of an ancient global civilization. She aspired to find keys to the secret scientific knowledge hidden in mythologies and religious-philosophical systems of antiquity. Thus, she was convinced that these keys had been preserved, first of all, in astronomy. Moreover, she insisted that the main keys were kept in the Indian mythology and traditional Vedic sciences.

Elena Blavatskaya in her ‘Secret doctrine’ approved that all religions go back to the Vedas, which hide a secret mathematical-astronomical information in a coded form, keys to which nowadays were lost and decoding of these codes can demand many centuries.

She paid attention to the ancient Indian theory of time and such

¹²⁴ Kim Plofker, ‘How to interpret astronomical references in Vedic texts?’ In: Electronic Journal of Vedic Studies (Ejvs) Vol. 6 (2000), issue 2 (December).

concepts, as the Life Span of Brahmā and the great coordinating periods (mahā-yugas) described in Purāṇas. She could not grope for some reliable ways of interpretation of these concepts, trying to explain all knowledge of the astronomical periods, the scientists of antiquity produced, by the revelation granted from other planets.

Having analyzed a Puranic legend about a ‘doomsday,’ at which seven ‘suns’ (more correctly, Planets) merge into one, and then again are divided into seven, she, in an emphasis, did not noticed here the clear description of a parade of planets. Nevertheless, she came much nearer to the essence of the ancient Indian science than many professional indologists of her time.



Juriy N. Roerich



Juriy Nicolaevich Roerich became an expert in Tibet Studies and composed a Sanskrit-Tibetan-English Dictionary. He returned to Russia with a big collection of books, pictures and other materials collected in Tibet during expeditions organized by his father.

Among his publications, there are articles touching the Tibetan doctrine of Kāla-Cakra, the ‘Wheel of Time’ or calendar.¹²⁵ He noted that the huge quantity of compositions was devoted to this doctrine, and its influence was felt in all Central Asia. To tell the truth, he was persuaded that its essence was mysticism, but noted that followers of Kāla-Cakra diligently studied Sanskrit, astronomy and astrology, and their books were marked with deep symbolism and filled with allegories and special Tantric terminology, understandable only to adepts. He also emphasized that this science contained keys to many layers of Buddhist outlook, such as, for example, legends about Shambhala, and that for its understanding the main disciplines were Indian astronomy and the doctrine of the 60-year cycle of the Jupiter. He called the doctrine about the ‘Wheel of Time’ *sancta sanctorum* of the Northern Buddhism. He described the major Tibetan primary sources of the Kāla-Cakra and set the task of translation of the basic texts, such as ‘Kāla-Cakra-Mūla-Tantra’ (‘the Radical Book about the Wheel of Time.’)

J. Roerich mentioned a legend described by Csoma de Körösh in his ‘Tibetan Grammar’ (p. 192,) in which Buddha was called the author of the doctrine of Kāla-Cakra, and his pupil Su-Candra (Sanskrit, ‘Fine Moon,) Emperor of Shambhala, ‘came’ to listen to Buddha with retinue of 96 ministers, and also with devas and asuras (about their

¹²⁵ Roerich, Georges, Studies in Kālacakra. In: Rerih J. N. Izbrannye Trudy (Selected Works.) Moscow, 1967. P. 153-165.

lunar nature see Ch. on Mythological Code in the Part II.) Suchandra also was a symbolical author of the ‘Radical Book about the Wheel of Time,’ and of its reduced variant and commentary consisting of 60,000 verses (a hint on the 60-year Cycle of Jupiter.)

J. Roerich preoccupied with a question about the site of the terrestrial Shambhala, ‘a haven of an advanced civilization,’ could not notice here enough transparent astronomical allegory. The matter is that five sidereal periods of Jupiter, underlying a 60-year Cycle, correspond to 96 sidereal periods of Venus consisting of 225.6 days:

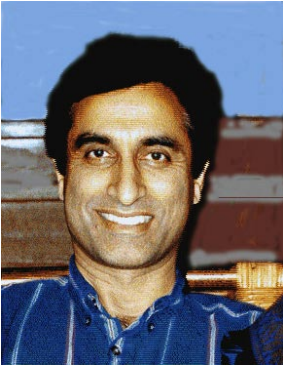
$$4332 * 5 = 21660; 21660 / 96 = 225.6.$$

This is a numerical clue to the mythological image of the asuras’ minister Śukrācarya. Now we know, he is sidereal Venus personified.

The question about terrestrial placement of the celestial Shambhala is enough simple – it was India and, in particular, Kashmir, which had been glorified during millennia as a haven of the major Vedic universities and academies. From here, Buddhism with its doctrine about a mythological-astronomical ‘heavenly Shambhala’ was spread in Tibet and all over the Far East.

Buddhist theory of Kāla-Cakra was based, undoubtedly, on the Vedic ‘theory of time’ or kāla-vāda. In the ‘Buddha-Charita’ (the ‘Biography of Buddha’) and in other Buddhist texts, there are mentioning of experts on kāla-vāda and also statements of Buddha himself on this issue. Both the Vedic and Buddhist doctrines are connected with the concept of Great Time as Great Essence of Life and with great coordinating cycles governed by Saturn (Yama or Kāla.) Half a watch on every day called ‘kāla-velā’ was dedicated to Kāla (Saturn,) when all ceremonies were prohibited. There are several hymns in the Atharva-Veda dedicated to Kāla as the god of Time embracing all the cosmos and all the other Vedic gods (AV, XIX.6.53-54.)

Subhash Kak



Professor Subhash Kak from the Louisiana State University, Baton Rouge, is contributing a lot to the decipherment of astronomical code in the design of Vedic fire altars, Vedic scriptures and Vedic Indus-Sarasvati script. He summarizes the work done in this respect by his American and Indian colleagues. No doubt, he is excited by the discoveries of archaeologists showing continuity in Indian civilization that goes back to at least 7000

B.C.E. and refutes the argument about the barbaric invasion of the Aryans.

He writes: ‘According to the work of Kenneth Kennedy of Cornell University there is no evidence of demographic discontinuity in archaeological remains during the period 4500 to 800 B.C.E. In other words, there was no significant influx of people into India during this period.’

‘B. B. Lal of the Archaeological Survey of India discovered fire altars in his excavations at the third-millennium site of Kalibangan. It appears now that fire altars were in use at other Harappan sites as well. Fire altars are an essential part of the Vedic ritual.’

‘Study of pottery styles and cultural artifacts has led archaeologists such as Jim Shaffer of Case Western Reserve University to conclude that the Indus-Sarasvati culture exhibits a continuity that can be traced back to at least 8000 B.C.E. Shaffer summarizes: ‘The shift by Harappans (after the drying up of the Sarasvati river around 1900 B.C.E.) is the only archaeologically documented west-to-east movement of human populations in South Asia before the first half of the first millennium B.C.E.’ In other words, there has been no Aryan invasion.’

So, Prof. Subhash Kak, after having analyzed the quantities of

verses of the R̥g-Veda, found, paralleling my own discoveries, signs of an enigmatic astronomical code.¹²⁶ He writes in the ‘Origins of Indian Science’: ‘Veda’ means knowledge. Since we call our earliest period Vedic, this is suggestive of the importance of knowledge and science, as a means of acquiring that knowledge, to that period of Indian history. For quite some time scholars believed that this knowledge amounted to no more than speculations regarding the self; this is what we are still told in some schoolbook accounts. New insights in archaeology, astronomy, history of science and Vedic scholarship have shown that such a view is wrong. We now know that Vedic knowledge embraced physics, mathematics, astronomy, logic, cognition and other disciplines. We find that Vedic science is the earliest science that has come down to us. This has significant implications in our understanding of the history of ideas and the evolution of early civilizations.’

‘The discovery of the details of the astronomical altar constructions code is a fascinating chapter in the history of astronomy.’

Subhash Kak guessed the calendar ritual and a planetary observational astronomy behind this mathematical ordinance. He is persuaded that astronomical numbers played a central role in Vedic ritual, which purpose was to devise geometrical schemes related to the lengths of the solar and the lunar years.

‘Researchers are now deciphering the ancient Indian Vedic texts with rich mathematical and astronomical content without keys trying to reconstruct the lost terminology, methodology, hermeneutical and cultural paradigm.’

‘A. Seidenberg of University of California at Berkeley reviewed the geometry of the fire altars of India as summarized in early Vedic texts such as the Shatapatha Brahmana and compared it to the early geometry of Greece and Mesopotamia. In a series of papers, he was able to establish that this Vedic geometry should be dated prior to

¹²⁶ Subhash Kak, *Astronomical Code...* Op.Cit.

1700 B.C.E.’

‘It has now been discovered that altar constructions were used to represent astronomical knowledge. Furthermore, an astronomical code has been found in the organization of the Vedic books. This code establishes that the Vedic people had a tradition of observational astronomy, which means that many astronomical references in the Vedic texts that point to events as early as 3000 or 4000 B.C.E. can no longer be ignored.’

‘Recent computer analysis of the texts from India have shown that the Brahmi script of the times of the Mauryan king Ashoka is derived from the earlier third millennium script of the Indus-Sarasvati age. This again is strong evidence of cultural continuity.’

‘The archaeological record shows that the Indus-Sarasvati area was different from other ancient civilizations in many cultural features. For example, in contrast to ancient Egypt or Mesopotamia, it shows very little monumental architecture; it appears that the political organization and its relationship to other elites in the society were unique.’

‘Taken together, the cumulative evidence completely belies the Aryan invasion theory. If an influx of people into India took place it should be earlier than 4500 B.C. E. if one considers the demographic evidence, and perhaps before 8000 B.C.E. if one considers other related evidence. On the other hand, it is equally plausible that the Sapta Sindhu region was the original homeland of the Aryans from where they migrated to Iran and Europe, as remembered in Puranic legends.’

‘In the Indian linguistic area itself it has been found that there exist deep structural relationships between the north Indian and the Dravidian languages. It is likely that the Vedic period represents an age much after the contact between these two linguistic families had begun; in other words, the early Vedic period might represent a synthesis between the north Indian and the Dravidian cultural histories.’

Belarusian New Integrated Hermeneutics

Russian indologist N. R. Guseva wrote in her book ‘Many-Sided India,’ ‘...Tremendous impression has been produced on me, indologist, by one, apparently, insignificant fact. I have arrived to Belarus to read lectures at the invitation of the Society ‘Znanie’ (Rus. ‘Knowledge.’) It was in Brest. I have come to the address specified in the permit of my mission and have stopped, not trusting my eyes, I have seen on the entrance door the tablet with inscription ‘Branch of the Republican Society ‘Vedas.’ Yes... The Vedas – knowledge... Russian ‘vedat’ (‘to know,’) ‘svedeniya’ (‘information,’) ‘vedun’ (‘knower,’ ‘wise man,’) etc.’¹²⁷



Yes indeed, many wars have swept through Belarus during modern time, and it underwent unprecedented destructions. All material evidence of the former greatness was lost. Still, every time it could revive as a Phoenix. Fortunately, the part of Ancient Russia, which later became Belarus, was not invaded by Tatars, as those parts, which later became Russia and Ukraine, and it could preserve many spiritual relicts of gray-haired times, which are going back to the Vedic exodus from India, and, hence, indestructible strength of mind and love to knowledge. Nevertheless, historical memory about the Vedic times was destroyed and, it seemed that there was no hope for organizing serious indological researches, especially, in the sphere of the Vedic Studies...

Being student of the Minsk’s Institute of Foreign Languages, I was acquainted with creative heritage of K. S. Stanislavsky and Leo Tolstoy. Through them, I became interested in yoga and began

¹²⁷ N. R. Guseva, *Many-Sided India*, Moscow, 1987, p. 20.

studying Vivekananda, Aurobindo, and modern Indian languages. Leo Tolstoy, as we have seen, had especially emphasized the value of the Vedas as sources of the Vedic philosophy important for reconstruction of global ethics. K. S. Stanislavsky's system developed for actors and spectators as for the participants of process of artistic empathy was accepted all over the world as the basis of theatrical education. In addition, it is well known that the science of preparation of actor developed by Stanislavsky is based upon the important principles of yoga and in part reflects deep concepts of an ancient Indian aesthetics of representation and empathy as Stanislavsky purposefully studied the rāja-yoga through works of the American author known under pseudonym Ramacharaka. It was repeatedly emphasized by my research guide late Prof. I. S. Serebryakov that the ancient Indian system of actor's play laid down in the work of Bharata on theatre and in comments of Abhinavagupta outstripped Stanislavsky's doctrine by millennia.

I mastered with occasional help of Oshit Kumar Odhikari, Chinnapan Paramesvaran and other Indian friends, who had been studying in Minsk and Moscow in 70-80-th, the basics of four Indian languages – Hindi, Bengali, Tamil and Sanskrit. Later, I had had still an opportunity to improve my Sanskrit during the whole year with a Russian Sanskrit scholar late Oktyabrina Fyodorovna Volkov. Then, I got acquainted in originals with the most important Indian philosophical works, such as the Upaniṣadas, commentaries of Shankara and Ramanuja to the Upaniṣadas, works of Vivekananda, S. Radhakrishnan, A. Ghosh, some other philosophers and historians and conceived a draft for the 'Reconstruction of Proto-Indian Outlook of the times of the Ṛg-Veda' as also a voluminous work under the title 'Anthology of Global Ethics,' new amended synopsis of the L. Tolstoy's ethical works.

The more I studied the world history and the history of literature and culture of India and Europe, Russia and Byelorussia, the more I came to belief that the Vedas were a part of our most ancient Bye-

lorussian spiritual culture. Ethnographer Yanka Kruk identifies not without some reason the Byelorussian national lunar calendar with Vedic one.¹²⁸ The Byelorussian language keeps thousands Sanskrit relicts. From toponymy and hydronymy, from fairy tales and ancient legends, the spirit of the Vedic mythology, ecological ethics and calendar religion is distinctively felt.

Principles of the Vedic philosophy find unexpected accord in such different sources as K. Tsiolkovsky's articles about the cosmic ethics, especially, his ideas about evolution of life and mysterious reasonable forces in the universe; E. Shrödinger's book about bio-physics, in which he insisted on correctness of the main principle of the Upaniṣadas about philosophical identity of individual and space consciousness and similarity of the doctrine of the Upaniṣadas and his own bio-physical doctrine; A. Einstein's works on the 'cosmic religion' resulted from his vision of the unified field theory, in which he asserted the Vedantic principle of gradual transformation of basic void space into more and more dense quintuple modular conditions of substance. A. Einstein believed that the Vedantic quintuple reality was the first sketch of the unified field theory, which he had been elaborating for the last fifty years of his life, and that the philosophy of Buddhism closely corresponds to methodology of modern theoretical physics. Some representatives of modern synergetics share his opinion.

The monistic dialectical Śivaism formulated in Kashmir by Sanskrit philosophers represented even higher generalization of the Vedic and Buddhist philosophies. It had been yet understood, in particular, by A. Schopenhauer. Russian philosopher N. A. Berdjajev also had paid special attention to Kashmir Śivaism.

In 1985, I have met really a 'great soul' Prof. I. D. Serebryakov, who turned to be a remarkable person and instructor. He contributed significantly to the development of Indology in Russia and Uzbekistan

¹²⁸ Janka Kruk, Symbolism of the Belarusian Folcloric Culture. Minsk, 2001. P. 174. (In Belarusian.)

and was eager to see these researches flourish in Ukrain, where he was born, and in neighboring Republic of Belarus. We had found at once common ground. I could begin my postgraduate studies (1986 – 1989) at the Historical Monuments Department of the Institute of Oriental Studies in Moscow. I studied historiography and archeography with specialization in the Indian textual criticism.

I have defended in 1991 in Tashkent my Ph. D. (in History) thesis ‘Kṣemendra’s Satirical and Didactic Poems as Historical Sources’ written under the guidance of late Prof. I. D. Serebryakov.

My first publication was a monograph dedicated to the literary inheritance of Kṣemendra with Russian translation of his several laḡhu-kāvyaś and a large mythological and literary commentary (1999.) Then I began to translate the Vālmiki’s Rāmāyaṇam.

I. D. Serebryakov bidding his farewell had told: ‘I, certainly, had taken you as my disciple with persuasion that you would work in Moscow... well, it is pleasant for me to realize, that now I will have followers not only in Russia, Ukraine, Uzbekistan... but also in Byelorussia.’ Later at the end of 90-ies, his widow Lyudmila Vyacheslavovna Serebryakov transferred to me a good part of his remarkable indological library.

Thus, my analysis of the Vedic literary tradition was originally formed in the stream of ideas of I. D. Serebryakov and his wide vision of literary process in India, unwrapped in many languages during millennia. He was persuaded that ‘the material of the Ṛg-Veda is so rich and various, testifies to such a high level of development of literature, that hardly it could be achieved by tribes dominated by patrimonial social organization. <...> The content of the Ṛg-Veda can be only an insignificant fragment of once rich literature blossoming in cities of the Indus Valley.’¹²⁹

As a researcher, I consider myself belonging to the brilliant Russian scientific tradition of Indological Studies set up by works

¹²⁹ Serebryakov I. D. *Essays on the Ancient Indian Literature*. Moscow, 1971. P. 67–68. (In Russian.)

of Prof. Th. Shcherbatsky on Buddhist logic and Vedic sciences and philological-historical studies of I. D. Serebryakov.

Igor Dmitrievich quite often held in his hands Bhartṛhari's 'Constitution of Speech' ('Vākyapadīya,') which, occasionally, contains a vast reflection on Time.¹³⁰ I started also studying the ideas of Bhartṛhari, the great philosopher of grammar and one of the greatest poets of the world literature. Under the influence of one lecture of I. D. Serebryakov read in a hall of the Foreign Literature Library in Moscow, my attention began to shift even more often to the ancient Indian concept of time and such concepts as the 'Life of Brahmā.' This period was considered usually on a formal basis as a period longer than the time of existence of our Big Universe according to modern astrophysics. It was necessary to identify it.

My research work of the heritage of Kṣemendra in Moscow included studying of the constellation of the most important Vedic and Hindu deities, contained in his didactic-mythological poem 'Cāru-Caryā-Śataka' ('Hundred Verses on Moral Conduct.')

This research demanded referring to 'epic' and Puranic literature, mythological dictionaries like 'The Dictionary of Ancient Biographies' ('Pracīna-Caritra-Koś') in Hindi, and to works on the Vedic mythology and culture, such as 'Rigvedic India' of A. Das and many others.

I found that devas ('gods, luminaries') were primarily symbols of lunar phases and lunar-solar-planetary periods.

Then under influence of studying the history of calendar and books of David Frawley, J. K. Trikha, Dh. D. Mehta and some other authors revealing connection of the Vedas with astronomy, with other exact sciences, my research was modified and concentrated on the studying of the history of the Indian astronomy and calendar.

After my postgraduate studies, I moved from Moscow to Gorki, Belarus, to my birthplace and the seat of the oldest institute of higher

¹³⁰ Bhartṛhari. About Time. (Tr. by I. D. Serebryakov.) In: Hundred-Petal Lotus: Anthology of Ancient Indian Literature, Moscow, 1996. P. 386-387. (In Russian.)

learning in the Republic (Belarusian Agricultural Academy,) due to the Moscow's turmoil of the beginning of the 90-ies. I had been a reader in History of Culture at the Agricultural Academy during ten years. Then, I had been reading from time to time short courses of lectures in Indian Philosophical Hermeneutics, Literature and Philosophy at Minsk's Universities. Unfortunately, as Indologist, I am working practically alone in this Republic and there is no institution to support my researches. However, this post-Soviet country was much safer, stable and quiet, that is why, I considered it the best place for a long and concentrated effort needed for deep Indological Studies.

Since 1989, I started to investigate the enigma of the astronomical number called the Life of Brahmā and astronomical hypotheses of the origin of the Vedic deities, in the light of definitions of time by Bharṛhari. I surveyed a mountain of books on astronomy and history of Western, Eastern and American calendars and, in 1991, began the regular analysis of digital ordinance of the Ṛg-Veda and decoding the Vedic calendar by means of the analysis of the digital framework of the ten maṇḍalas of the Ṛg-Veda. Soon, a truly 'revolutionary' calendar theory of the Rigvedic recitation was born and brought into focus in comments to my Russian translations of Kṣemendra's poems submitted to the Belarusian Republican Foundation of Fundamental Studies in 1991-1992. It was the calendrical theory of the core Rigvedic recitation.

My method of decoding of the Vedas is based mainly upon the analysis of the scientific integrated interpretation of Sāyaṇa (XIVth century) and on reinterpretation of the Vedic exegetical texts, such as Brāhmaṇas, Upaniṣadas, and 'Nirukta' ('Etymology or Analytics of Vedic Latent Meanings.')

Significant enlightenment came after acquaintance with B. L. Van-der-Waerden's book 'Awakening of Science II: The Birth of Astronomy' (Moscow, 1991, Russian tr.) Under influence of his fascinating exposition of ancient Middle East observational astronomy, astral religion and great coordinating periods, an assumption appeared

that the Life Span of Brahmā should have represented a certain ‘Big Year’ or a planetary coordinating period designed in parts of a second such as, for example, truti and lava.

It is curious that later, I lighted on a book by A. Gorbovsky ‘Riddles of Ancient History’ and found a similar way of interpretation of the number 195955200000000 found in Sumerian records as representing approximately $\frac{2}{3}$ from the Life of Brahmā. According to Gorbovsky, ‘in course of a complex ideation, this number have been considered as amount of seconds of time and it have been found out that it gives the whole quantity of days in 240 periods of precession of the equinoxes consisting of 25900:

$$195955200000000 : 86400 = 2268 \text{ million days.}’$$

Gorbovsky is slightly inexact: actually, these are 240 periods of 25873.24 or only 6209578 years of 365.2422113 days.



Nathalya with our grand-son, Nadezhda, and Maria

The Life of Brahmā, really, can be divided by quantity of seconds in a day without residue and is multiple to quantity of seconds in a day and to the period of precession (vide Part II)! Nevertheless, ancient Indians used the system of chronometric units, among which there are many, which are in millions and billions times less than a second! My reasoning and conclusions are essentially different from those of Gorbovsky. Nevertheless, Gorbovsky’s method based on confidence in coded character of ancient knowledge and on examining of the big numbers as the calendar periods expressed in seconds seemed true and has strengthened me in confidence that my own researches are not deprived of common sense.

Later I have read a number of Indus inscriptions not probabilistically, but in strict accord with mathematical-astronomical logic of

ancient Vedic observational astronomy and our Vedic astronomic-chronometric computer theory, and found in them a real stock of precise chronometrical formulas, packed with equimultiples of the Life of Brahmā.

In 1994, an article in Belarusian language was published.¹³¹

Unfortunately, it stayed practically unnoticed. However, in January, 1994, due to support of the Byelorussian Fund of Basic Researches and Fund Soros-Belarus, some of these reasons were submitted to the attention of the IXth World Sanskrit Conference held in Melbourne (Australia,) where the report had captured attention of some outstanding Indian and Western scholars.

Then, my research was intensified with the advent of personal computer in the middle of 90-ies.

In 1994-95, I had written a book in English entitled 'Ṛg-Veda as a Recital Calendar-Chronometer' and sent it to some indologists. One of them, doctor V. P. Pathak from Bombay responded with approval. Later in 1997, it attracted the attention of Prof. S. Upadhyaya from the Bombay branch of the Bharatiya Vidya Bhavan (Institute of Indian Culture,) to whom I had shown it during my tour across India right after the World Sanskrit Conference held in Bangalore, and still later in 2001, it had been published by him in Bombay.

A little later, the theory of ancient Vedic mental computer was formulated with principles of its chronopoetics. In 1997, the second paper was submitted this time at the Xth World Sanskrit Conference held in Bangalore. It had been written together with Nathalia Mikhailov and was devoted to the same problem considered from the point of view of the theory of probability. This report was based on the analysis of all possible sums, which can be produced by combinations of quantities of songs in various maṇḍalas of the Ṛg-Veda.

¹³¹ Mihailaw, M.: Tajamnica Vedaw: Kaljandarna-hranaljagičnaja gipoteza pahodžannja vedyjskih s'pevaw (The enigma of the Veda: The calendar-chronological hypothesis of the origin of the Vedic recitations.) In: Kriwja: Crivika, Baltica, Indogermanica, Issue I. Mensk, 1994, p. 63 – 74. (In Belarusian.)

The total array of these combinations had been excellently distilled by my daughters Nadezhda and Maria, at that time students of the Belarusian State University (Minsk,) by means of the programs composed by them in Pascal.

Then, I collected lunar astronomical data in the Ṛg-Veda and discovered that the coherent synergetic text reconstructed as a planetary calendar contains a precise date of its composition. The textual astronomical data carefully collected and reinterpreted permitted me to connect unequivocally the Vedas with the beginning period of the Indus civilization. The calendrical observations codified in the Vedic texts date either from the beginning of C.E. (apparently, one thousand years earlier than Christianity in global chronology of the Russian mathematician T. Fomenko) or from 6.5 thousand B.C.E. in presently adopted erroneous chronology of French scholar and critic Joseph Justus Scaliger (1540–1609) and Dionysus Petitius. It permits me to insist on that the Vedic texts were produced at a period much earlier than Egyptian pyramids, Stonehenge, Rome, or any other known civilization in a respective chronology.

In 2000, I presented the paper on the astronomical dating of the Ṛg-Veda at the XIth World Sanskrit Conference held in Turin. According to one of respectable western professors, the report caused a shock: on my remark that the Western colleagues had not put any question, he replied not without humor that they simply could not as they ‘sat with an open mouth.’ Not numerous Russian colleagues reacted enough strangely, – in a vast hall, there was none of them. They, probably, were led by their persuasion – what indology can exist beyond the Moscow’s city boundaries.

Among Indian scholars, on the contrary, this presentation found the hottest support. Professor Ram Karan Sharma declared that the report was of great interest and should have been published ‘for the benefit of all of us.’ I was brought after the speech to the eyes of the Prof. Venkatachalam, then Chairman of the Indian Council for Philosophical Researches, who asked a copy for himself so that

the results received by me would be checked up by astronomers of Banaras. I am proud that my reevaluation of the astronomical data in the Ṛg-Veda and its date attracted the attention of the late Prof. Mandan Mishra and some other distinguished participants of the World Sanskrit Conference in Turin (2000.)

In four papers presented at the precedent World Sanskrit Conferences, I gave a glimpse of my theory of the Ṛgvedic maṇḍalas being planetary calendar, which syllabic substructure formed at the same time a recital clock-chronometer. But still, I have not been able to substantiate a bold guess, at which I arrived yet in 1993 intuitively, that the collections of Vedic mantras could be regarded as astronomical planetary tables or, probably, mathematical tables of sines or chords. They really looked like that, but it seemed that it was impossible at that time to find any mathematical evidence or proof. And the very idea seemed foolish.

Unexpectedly, we have found new evidence proving the soundness of that guess. A lucky hint came from Prof. Ram Karan Sharma, who explicitly delineated algorithms or mathematical procedures of the Chandaḥ-Śāstra of Piṅgala¹³² relevant to this topic at the XIth WSC held in Turin (2000.) I knew them only through sketchy descriptions and, truly speaking, was afraid of studying the intricacies of the sophisticated text of Piṅgala. R. K. Sharma demonstrated vividly on concrete examples how the total quantity and numerical order of the multiple modifications of syllabic meters could be exactly determined for any prosodic modification.¹³³ He noticed also that a proper mathematical evaluation is still wanted.

Having returned home, I showed his amazing examples to my

¹³² Piṅgala-nāga, The Chandaḥ-śāstra with the Commentary Mṛtasañjīvanī by Śrī Halāyudha Bhaṭṭa and with the Chandonirukti by Samikṣacakraṇvartī Śrī Madhusūdana Vidyāvācaspati, (Kāvya-mālā, 91), Bombay, 1938, pp. 4-5.

¹³³ R. K. Sharma, Pratyayas in Indian Metrics. In: XIth World Sanskrit Conference, Turin, Villa Gualino, April 3rd – 8th, 2000: Summaries of the Papers, Torino, 2000. P. 136.

wife, Nathalya Mikhailova, who is the reader in Mathematics at the Belarusian Agricultural Academy. She immediately recognized in them the binary code and Pascal triangle. This gave us an impetus to reread the Chandaḥ-Śāstram of Piṅgala together. We carefully translated and analyzed all its rules and came to the paradoxical conclusion that its primary objective was explanation and classification of the binary codes used for composing of large astronomical tables in verse. We interpreted the Vedic Science of Metrics as an algebraic Science of Binary Encoding developed for the purpose of mapping the sky.

This newly found method of decoding fit well my theory of calendrical computation by means of Vedic mantras promising extraordinary results. Then, having found the method to apply Piṅgala's algebraic code (obviously developed before the actual composition of the Vedas) to the Vedic text, I reread with the aid of computer some hymns of the Ṛg-Veda along the lines of binary encoding so formidably delineated by Piṅgala and his commentator Halāyudha and found a mathematical layer of strict astronomical data. The results were published in Russian as 'A Key to the Vedas,' (Minsk, 2001.)

I was exceptionally honored by the invitation of Prof. Vachaspati Upadhyaya to participate in the World Sanskrit Conference held in 2001. The government of India arranged that Conference in New Delhi on the occasion of the proclaimed 'Year of Sanskrit.' I read the paper prepared together with Nathalia Mikhailova on application to decoding of the Vedic text of the code of Piṅgala revealing in the Vedic text considered until then sacral and philological a layer of the exact scientific data.

An another inspiration came two years later from Prof. Ram Karan Sharma, who had written to me that he was most interested in the latter study presenting international interest and was eager to discuss it.

Then in the following years, the brain and computer storm aimed at final elucidation of the secrets of use of the mathematical binary

code in the 'Holy Scripture' had been undertaken. The research began to yield good results one by one. Analyzing the complex diagram of quantities of verses in the Vedic hymns, which has an obvious rhythm, we should note that the sizes of songs mark enough definitely months, weeks, seasons, years, year cycles and, probably, movements of the Sun or the full Moon through the 108 'steps' (padas) of ecliptic and nodes of the Lunar orbit. We discovered that the text of the Vedas has a twisted multilayered multipurpose mathematical warp and woof organization, which is the product of a synthesis of several mathematical-calendrical codes.

During the last four years, I had been reformulating the basic principles of Vedic interpretation and developed a chronometric theory of the Vedic analogue-digital mnemonic computer.

The general description of this theory and algebraic and other codes including the Vedic script (erroneously labeled Harappan) has been published as the second enlarged three-volume edition of a previous Russian publication (*A Key to the Vedas.*) It opens an absolutely new perspective of Vedic interpretation, which I call New Vedic Hermeneutics, and unexplored mathematical-astronomical vista from within the texts usually considered purely religious-mythological ones. This book is an authorial translation of the latter publication.

Surprisingly, my paper proposed to the forthcoming World Sanskrit Conference, which had been to be held in Helsinki two years ago, had been rejected by Prof. A. Parpola as not being focused in the 'field studies.' My offer to read the paper in Moscow at the International Congress of Orientalists was left without the answer either.

During the last two years, I have mathematically decoded in the R̥g-Veda a number of mythologically expressed astronomical periods such as Brahma, Meton, Mars, Rāhu... I have deciphered the true meaning of the devatās, ṛṣis and mantras, the exact chronometry of the Rāmāyaṇa, the Mahābhārata including the Bhagavadgītā and read digitally the quite a good number of Harappan inscriptions in perfect

accord with my calendrical-astronomical theory of Vedic chronometry formulated in 1992–1994. Now, I know for sure that this script was one of the most important printing mathematical Vedic codes. I have a host of serious assumptions and logical approaches to read it mathematically, linguistically as well as according to the Vedic calendar, Sanskrit mythology and Tantrik alphabetical principles.



Jantar-Mantar (Yantra-Mantra)

18. ASTRONOMY AND CALENDAR (JYOTISHA-VEDANGA)

Astronomy and the first calendars appeared in the Stone Age. The science of time reckoning was the most important knowledge, which was respected as sacred by all ancient peoples, because it helped to unify their social efforts and, consequently, preceded the creation of the first civilisations.

The star sky since the most ancient times, from the very appearance of man on the planet, draws his attention to itself. Its attraction became soon invincible, especially, after the invention of calendar (already in Paleolithic era 40 – 15 thousand years ago,) exact chronology (in VIIth – IInd millennia B.C.E.) and mathematical astronomy (Ist millenary B.C.E.) There are many drawings symbolizing phases of the moon and alternating with calendar and mathematical signs, marking, obviously, months, years or days in the caves of the Stone Age, which are found in Europe, Siberia and India. Picturesque representation of stars as animals and men formed the basis of mythology.

The Proto-Indians had perfected lunar, solar, lunar-solar and planetary calendars.¹³⁴ The science of astronomy, astronomical mathematics and calendar were regarded as the main sciences explaining the mechanism of the universe, design of the Vedic myths, metaphors and paradoxes of the Vedic philosophy. They included calendar science in the group of essential Vedic sciences and compared it to the ‘eye of the Vedas.’ This science is really the key to the Vedas, explaining the Vedic worldview, Vedic myths, Sanskrit metaphors and paradoxes of the Vedānta philosophy.

Subhash Kak writes in an article ‘Indic Ideas in the Greco-Roman World:’ ‘For many years the mainstream view was to take Indian astronomy as being essentially derivative, based on Mesopotamian

¹³⁴ Albedil, M. F. Proto-Indian... Opp. Cit. Pp. 244 – 249.

and Greek sources. This view arose from the belief that the Indians did not possess a tradition of sound observation. This view was proven wrong for the Siddhantic period by Roger Billard (1971) who, by using computer analysis, showed that the parameters used in the Siddhantas were accurate for the date of the texts, establishing that they couldn't have been borrowed from some old source outside of the country.'

The astronomy of the Vedic fire altars indicates that there was a long tradition of astronomical observation in India.

Romaka and Paulisha Siddhāntas in Varāhamihira's Pañcasiddhāntikā, are not connected to the names of Rome and Paul, but to the Sanskrit names of the Sun. The planetary model of these early siddhāntas is an extension of the earlier Indian theory.

In another publication, he writes: 'Using hitherto neglected texts, an astronomy of the third millennium B.C.E. has been discovered recently. Yajnavalkya (1800 B.C.E.?) knew of a 95-year cycle to harmonize the motions of the sun and the moon and he also knew that the sun's circuit was asymmetric. The second millennium text Vedāṅga Jyotiṣa of Lagadha went beyond the earlier calendrical astronomy to develop a theory for the mean motions of the sun and the moon. This marked the beginnings of the application of mathematics to the motions of the heavenly bodies. An epicycle theory was used to explain planetary motions. Later theories consider the motion of the planets with respect to the sun, which in turn is seen to go around the earth.'

The high level of Vedic astronomy is testified by five special treatises (siddhāntas,) which number according to tradition was 18. Each siddhānta describes an astronomical system with its own constants.

In addition to these siddhāntas, practical manuals, astronomical tables, description of instruments, and other miscellaneous writings have also come down to us. The Purāṇas also have some material on astronomy.

Some dozens of sophisticated tools are described and some medieval observatories in Jaipur, Delhi and other cities have survived.

Medieval observatories were equipped with amazingly exact tools reducing possible mistakes to a minimum.

Europeans could get a glimpse of this knowledge only in the VIIth century via the Arabs. But ancient Indian mathematics and mathematical astronomy were unknown to them till the Modern Times. To my mind, the scientific and industrial revolutions in Europe could not be possible without the inflow of scientific ideas from India.

Every Veda-Saṁhitā was accompanied by a brief manual of calendar, called jyotiṣa-vedāṅga. Unfortunately, though every Vedic scholar understands the value of the Vedic calendar science, its contextual-organizing function has not been consistently applied to the Vedic interpretation, and ancient Sanskrit texts continue to be treated even by those who tried to investigate their astronomical purports as a conglomerate of casually collected texts composed at different epochs.

Jyotiṣa has helped us to find a key to the complex authorial and dedicatory codes and to solve the enigma of the Vedic ‘prophets’ and ‘gods.’



19. IMPORTANCE OF TIME

The importance of time in synchronization of joint actions of people is so high, that it will not be an exaggeration to tell that namely time underlies development of gesticulation, dances, rituals, languages and culture as a whole.¹³⁵

Several International astronomical conferences, held in America and Europe during the last decades, had been focused on problems of the history of calendars. The problem of time in history was discussed with enthusiasm on the International historical congress in Madrid in 1990, which emphasized the main role of the account of time for all kinds of human activity. Undoubtedly, these problems represent a certain interest for sociologists as it is seen from proceedings of the XIIIth World Congress of Sociologists (Bielefeld, Germany, 1994.) The IXth–XIth World Sanskrit Conference, which I had honour to attend, also revealed a deep interest of scholars to this problem. For example, Professor R. K. Sharma in his lecture on ‘Mahābhārata’ emphasized the importance of calendar aspects of the Vedic recitation, reflected in the ‘Śata-Patha-Brāhmaṇa.’

Thousands of ancient calendars from Asia, Europe and America dated from the 18th – 2nd millennia B.C.E. are described in modern researches. Comparison of a Stonehenge (constructed in 1700 B.C.E.,) an astronomical complex near Yerevan (IIIrd millennium B.C.E.,) a calendar from Malta (7500 B.C.E.,) the Dagestan calendars (8th – 9th millennia B.C.E.,) a lunar calendar on a mammoth bone from Gontsy (Ukraine, 15th – 10th millennia B.C.E.,) the solar calendar engraved on a sculpture from Achinsk (Siberia, 18th millenary B.C.E.) gave a push to Russian archeologist V. E. Larichev¹³⁶ to reformulate the principles of the paleoastronomy founded by Norman Lockier (1836

¹³⁵ Moiseeva N. I. Time Within and Beyond Us (In Russian.) Moscow, 1991. P. 19–33.

¹³⁶ Moiseeva, Opp. Cit. P. 12.

– 1920.)

Destinies of Stonehenge, pyramids of Giza, huge Nasca drawings and pictures of Dagestan on the one hand, and of the Vedas, on the other hand, are enough different. However, they were crossed on a threshold of this space and computer era! All these monuments have, undoubtedly, the common origin, being various devices for the time reckoning. Global presence of ancient megalithic observatories, domination of lunar calendar in them, astronomical-calendar decoding of the Stonehenge and American pyramids, numerous works of the last decades on calendar customs and calendar songs of different peoples have predetermined also our method of decoding of the great Vedic recitative astro-encyclopedia.

Let's note one advantage: whereas decoding of the information coded in architectural constructions encounters a lot of difficulties, such as, for example, absence of any instructions and methods of authentic check, to our happiness, in the case of the Vedic calendar the researcher has at his disposal the Vedic sciences (śāstras) and the philosophy of Time formulated by Vyāsa, Bhartr̥hari and others helping to comprehend rationalistically the chronometric nature of the Vedas and their ritualistic recitation.

B. G. Tilak following the method of researches devised by J. Bentley, H. T. Colebrooke, A. Weber, M. Biot, V. D. Whitney, M. Haug, interpreted the Vedic annual ritual sattrā as a calendar ceremony and had shown that the ancient calendar was related to a ritualistic system based on equation Prajapati (Father of all lunar creations or the phenomena) = yajña (a calendar ceremony) = samvatsara (year.) Trusting the wrong belief that 'there are no earlier works about Vedic calendar except for the small treatise about jyotiṣa (astronomy),' he was convinced that 'our information concerning the most ancient calendar should be gathered, therefore, either from the separate references contained in Vedic works, or from the ancient compositions belonging to the ancient ritualistic literature of India.' It seems that this belief has been kept until now, interfering a lot with

the construction of general theory of the Vedic calendar.

So, according to one of the most authoritative European hypotheses, developed by F. B. Y. Keuper on the basis of theories of A. Hillebrandt, the Aryans of the Vedic period imagined time as a cyclic process. Cycles were years, and nucleus of the Vedas was a New Year's festival, a ceremony of eulogy of reorganized cosmos or time.

Contrary to that, I offer a calendar theory of Vedic recitation, according to which the Vedas were the magnificent recitative eternal calendar coordinated with all planetary periods, months, days, hours and seconds, which is capable to give the answer to the rhetorical questions formulated by K. Plofker, and to a set of other more serious ones.



Brahmā

20. WORSHIP OF KALA AND MAHAKALA

Mahākāla, Great Time, is the Father of all living beings and phenomena of the Universe.

*Śaṅkara
Time is named the director holding strings of management of the universe. With obstructing and favoring, it divides all.*

*Bhartrhari 'Vākyapadīya'
(the Analysis of Speech'),
section 'About Time', 4.*

Two hymns of the Atharva-Veda (XIX, 53 and 54) and many consequent texts were devoted to Kāla, Time personified, and to Mahākāla, 'Great Time' or Eternity. Time was considered as the main cosmogonic factor. Namely Time is responsible for the cyclical creation and destruction of the Universe, described in Purāṇas. It is proclaimed to be the highest deity by the Itihāsas and by Śaṅkara, renowned interpreter of Vedānta.

That Great Celestial or God (Mahā-Deva) was identified with Great Time specifies transformation of time into the highest value of the ancient Indian civilization already at its birth during the Vedic epoch. Complexity and accuracy of the calendar notions contained in the Vedic compositions is an essential indication of the advanced city civilization.



However, the astronomical analysis of these notions has not been carried out until now, having been confronted with many methodological and textual difficulties.

A specific feature of the ancient Indian calendar system is that Time 'flows' in accord with the synodical and sidereal rotations of the 9 'planets' (grahas,) where 'synodical' period designates the return of a planet to its former position in relation to the observer (from Greek

‘synodos,’ ‘meeting,’) and sidereal period designates the return of a planet to the same star (from Lat. ‘sidus,’ ‘star.’) For the observer, the superior planets follow the loop orbits, and the inferior ones are visible only in the evening or in the morning. At the end of certain periods, the planets range along one straight line constantly repeating their configurations.

That creates freakish walk-around resembling a dance under the baton of the Moon (in Indian mythology Śiva-naṭa-rājā, King of dances of the stars.) B. L. Van-der-Waerden¹³⁷ points at a similar concept in Greek and Roman ancient astronomy, which declared the Sun the coryphaeus of the dance of planets.

The Vedic texts quite often identify Prajapati, Sūrya, Śiva, the sacrificial horse, the sacrifice itself with a day, a month, a year, emphasizing their isomorphism (Bṛhadāraṇyaka-Upaniṣada, 1.1; Praśna-Upaniṣada, I, 9-13.)

The same tendency is present as well in the Persian religion as it has been shown by B. L. Van-der-Waerden. In Zervanism, the god of Time Zervan (Zurvan; cp. with Snsk. Dhruva, ‘Empire, state,’ ‘North star,’ Śiva, Saturn) is considered the creator of all things and the father of two twins – Ormuzd (Ahura Mazda, cp. Snsk. Asura Mhādeva) and Ahriman (personification of the light and darkness, probably, of the day and night, of the light and dark halves of the lunar month and year, cp. Snsk. Aryaman.) Zervanism was popular in late antiquity on Sicily, in Syria among magicians and in all the empire of Sassanids.¹³⁸ The same approach as we have noted earlier, had been characteristic for Taoism as well.

Kālavāda or the theory of Time

The doctrine of Time had been set forward by the Mānava-Dharmaśāstra, the Arthaśāstra, the Mahābhārata and the Purāṇas.

¹³⁷ B. L. van der Waerden, Opp.Cit. P. 145.

¹³⁸ B. L. Van-der-Waerden, Opp. Cit., p. 168.

Certain scientific principles of the ancient chronometry are found in the ancient phonetic, metrical and special astronomical treatises.

As the main deity of the Vedas is Great Time, it is not surprising that the main doctrine of the Vedas is *kāla-vada* (the doctrine of time) or the doctrine about *kāla-cakra* ('a wheel or cycle of time.')

The exact scientific principles of ancient chronometry are enunciated in the ancient phonetic and astronomical treatises named *siddhāntas* ('canons.')

The primordial significance of the Vedas, in my opinion, consisted in that it represented in the symbolical form principles of the astronomical part (*siddhānta*) of the *vyomaśāstra*, that is, mathematical astronomy, and chronology or *kāla-vada*, which is a leitmotif of the cyclic Vedic chanting.

Time was analyzed by Proto-Indians from the various points of view. The treatise '*Yogācāra-Bhūmī*' ('The Foundation of Yogic Behavior,') for example, quotes Varṣagaṇya, speaking about a distinction of two varieties of time constancy: 'Consequence is present in the reason in fact eternally by means of eternal time and constantly by means of constant time.'

Kāla-Cakra or the Wheel of Time

The traditional Indian system of time units repeatedly with some variations is described in the Vedic texts. Usually Puranic universal time scale is presented as having divisions from $1/_{34000}^{\text{th}}$ of a sec. up to 4.32 billion years.

Table 8.

Vedic universal time scale

1 krati	= $1/_{34000}^{\text{th}}$ sec.
1 truti	= $1/_{300}^{\text{th}}$ sec.
2 truti	= 1 lava
2 lava	= 1 kṣaṇa
30 kṣaṇas	= 1 vipāla
60 vipālas	= 1 pāla

60 pālas	= 1 ghaḍi (24 min.)
2.5 ghaḍis	= 1 hora (1 hour)
24 horas	= 1 divas (1 day)
7 divas	= 1 saptaḥ (1 week)
4 saptas	= 1 ṛtu (1 season)
2 māsa	= 1 ṛtu (1 season)
6 ṛtus	= 1 varṣa (1 year)
100 varṣas	= 1 śatābda (1 century)
10 śatābda	= 1 sahasrābda (1 millenary)
432 sahasrābdas	= 1 yuga (kali-yuga)
2 yugas	= 1 dwapara-yuga
3 yugas	= 1 treta-yuga
4 yugas	= 1 kṛta-yuga
10 yugas	= 1 mahā-yuga (4320000 years)
1000 mahā-yuga	= 1 kalpa
1 kalpa	= 4.32 billion years.

Modern thinkers take this system for granted. Sagan says that ‘Hinduism is the only religion in which the time scales correspond... to those of modern scientific cosmology. Its cycles run from our ordinary day and night to a day and night of Brahma, 8.64 billion years long, longer than the age of the Earth or the Sun and about half the time since the Big Bang.’ He could add that the Life of Brahmā is substantially longer.

The Artha-Śāstra gives slightly different universal time scale where the initial unit is truti (see Table 8.)

Table 9.

Time Units According to Artha-Śāstra

	Instants, days, months		Trutis	Seconds
1	2 trutis	1 lava	2	0.12
2	2 lava	1 nimeṣa	4	0.24
3	5 nimeṣas	1 kāṣṭhā	20	1.2
4	30 kāṣṭhās	1 kalā	600	36
5	40 kalās	1 naḍikā	24000	1440

6	2 <i>naḍikās</i>	1 <i>muhūrta</i> (48 min.)	48000	2880
7	30 <i>muhūrtas</i>	1 <i>aho-ratra</i> (day-night) including 6, 8, 10 or 2 watches	1440000	86400 (2 days = 172800 sec. – $\frac{1}{10}$ of <i>krta-yuga</i>)
8	(13, 14,) 15, (16) <i>aho-ratras</i>	<i>Ardha-māsa</i> (half month)	21600000	1296000
9	(27, 28, 29,) 30, (31-37) <i>aho-ratras</i>	<i>māsa</i> (month)	43200000	2592000
10	(1, 2,) 3, (4-6) <i>māsas</i>	<i>ṛtu</i> (season)	129600000	7776000
11	6, (7) <i>māsas</i>	<i>ayana</i> (half year)	259200000	15552000
12	2 <i>ayanās</i>	<i>varṣa</i> (year = 360 days)	518400000	31104000 $\frac{1}{1000000}$ of the Life of Brahma
13	5 <i>varṣas</i> 5 * 360 days	<i>yuga</i>	2592000000	155520000
14	12 years	<i>samvatsara</i> (Jupiter's sidereal cycle)	6220800000	373248000
15	5 <i>samvat-saras</i>	<i>bārhaspatya-māna</i> (60-year 'Jupiter's measure')	31104000000	1866240000
16	The Life of Brahmā	600000 years	311040000000000	

2 *ayana* ('ways') include *uttara-ayana* ('superior,' 'northern,' bright, summer course of the Sun) and *daśina-ayana* (the 'right, 'southern, dark, winter course of the Sun.) The latter term suggests the opposite *vāma-ayana* (the 'left course of the Sun') and its relation to the term *vāma-ācāraḥ* or *vāma-mārḡaḥ* ('the left hand way or ritual of the Tantras.) The 'ways' are defined in relation to the observer located with his face to the East as an initial direction.

Bārhaspatya-māna is used in Southern India, Tibet and China

even today.

All amounts of trutis and quantities of seconds in various sub-periods of the Life of Brahmā are met on the Proto-Indian seals in various records. This testifies to an antiquity of this system of chronometry and is an original master key to the printed Vedic code (see Part II, ch. 'About the Vedic Printed Code.')

From the table, in which sizes of the basic calendar blocks are restored in trutis, it is seen that the Life of Brahmā is equal to ten thousand 60-year periods of Jupiter. Ten years ago, I established that this period, which had obviously started from a certain bright parade of planets, was exact coordination of all nine planetary periods, all years and the basic months to within the sixth digit after a decimal point. Two years ago, I found out having deciphered the digital sense of Proto-Indian inscriptions that the number '600000' meets sometimes as a key factor on the Vedic calendar seals expressing the Life of Brahmā. It is represented there in the form of a 'six-teeth rake' (see ch. 'About the Vedic Printed Code.')

This period, undoubtedly, is similar to the period, which I had previously reconstructed from the 'army' mythologem of the Mahābhārata (see ch. 'About Mahābhārata's chronometry in the Part II.)

Types of Months

The basic types of months used in the Vedic calendar calculations for prediction of eclipses and parades of planets are the following:

Synodical month (candra-māsa,) which is a period between two full moons (29.530588 days) expressed in texts as 29 and 30 days, occasionally as 32 ($32 * 12 = 384$) and 77 days ($77 * 5 = 385$);

Sidereal month (nākṣatra-māsa,) which is a returning of the Moon to the same star (27.321661 day) expressed in texts as 27-28 days; (the Moon goes from the west to the east);

Draconian month (rāhu-māsa,) named so in honour of the 'dragon-eclipse,' which abides in the nodes of the lunar orbit, that is,

places of crossings of the ways of the Sun and the Moon and denoting the returning of the Moon to the same node (27.21222 day) found in the texts as 27-28 days;

Anomalystic month – the returning of the Moon to a perigee or apogee (27.5545 day) represented in the texts as 27-28 days;

Conventional months:

Solar (saura-māsa) – 36-37 days ($5 * 36 + 5 * 37 = 365$) or 73 days ($73 * 5 = 365$);

Ritualistic (savana-māsa) – 30 solar days ($30 * 12 = 360$), which is most close to the $\frac{1}{12}$ of the period of Jupiter and is mean month between synodical and solar ones;

The ‘month’ of the synodical period of Jupiter – 19 days ($19 * 21 = 399$) and 361 day (19^2): $19 * 228 = 361 * 12 = 4332$;

‘Months’ of the synodical and sidereal periods of Saturn – 18 days ($18 * 21 = 378$) and one avatar (embodiment of Viṣṇu) or 1080 days ($1080 * 10 = 10800$);

‘Months’ of the synodical and sidereal periods of Venus – 45 ($45 * 5 = 225$) and 73 ($73 * 8 = 584$);

‘Months’ of the synodical and sidereal periods of Mars – 19 days ($19 * 41 = 779$); 60 ($60 * 13 = 780$) and 49 days ($49 * 14 = 686$.)

According to the Devī-Bhagavata-Purāṇa (9th Skandha,) the daily time is measured with the help of the following units:

Table 10.

Units of day time scale according to the Devī-Bhāgavata-Purāṇa

	Units of the DBhP		Sec.	Min.	Hours
1	<i>Puncture of a leaf with a pin</i>	<i>Alpa-kāla</i>	1,2345679 ⁻⁶ or 0,0000012345679		
2	<i>30 Alpa-kālas</i>	<i>1 truti</i>	3,7037 ⁻⁵ or 0,000037037		
3	<i>30 trutis</i>	<i>1 kalā</i>	0,00111...		
4	<i>30 kalās</i>	<i>1 kaṣṭhā</i>	0,0333...		
5	<i>30 kaṣṭhās</i>	<i>1 nimīṣa (mātrā)</i>		1	

6	4 nimīṣas	1 gaṇita	4		
7	10 gaṇitas	1 netu-virpu (full inspira- tion)	40		
8	6 netu-virpus	1 vināḍikā	240	4	
9	6 vināḍikās	1 ghaṭikā	1440	24	0.4
10	60 ghaṭikās	1 aho-ratra	86400	1440	24

The least time unit (alpa-kalā) is determined to ten trillionth of a second and even is correlated to an ordinary action.

We can assume that postulation of infinitesimal instants of time had been caused not by idle freak of imagination, but a really important problem, first of all, the coordination of the periods of planets in integer units in the context of their real orbits' lengths and speeds.

It is highly probable that the orbits of the stars of the Galaxy and their speeds were also examined, including the instant speed of planets with the use of differential time calculus.

Many other chronometric models for measurement of time were given in the Śāstras and the Purāṇas, in which the minimal time units are defined as it is shown in Table 11.

Table 11.

The Basic Chronometric Models

	Minimal unit	Day and night	Sanskrit source
1	1,2345679 * 10 ⁻⁶ or 0,0000012345679 sec. (3,7037037 * 10 ⁻⁵ or 0,000037037 sec.)	69984000000 alpakāla (2332800000 trutis)	Devī-Bhagavata- Purāṇa, 3rd Skandha
1	0,0000296 sec. or 2,97 * 10 ⁻⁵ sec.	2923513576 trutis	Comments of Prashastapada to Vaiṣeśika-Sūtra ¹³⁹
2	1,333 * 10 ⁻² sec.	6480000 tatkṣanas	Śārdūla-Karṇa- Avadāna
3	2 * 10 ⁻² sec.	4320000 trutis	(= Mahā-yuga)

¹³⁹ E. I. Gosteeva, Vaisheshika Philosophy. Tashkent, 1963. P. 85.

4	$5,8 * 10^{-2}$ sec.	1489655 trutis	Śārdūla-Karṇa-Avadāna
5	$6 * 10^{-2}$ sec.	1440000 trutis	Artha-Śāstra
6	0,13888... sec.	622080 trutis	(Internal speech)
7	0,145 sec.	595200 nimeṣas	Śārdūla-Karṇa-Avadāna
8	0,176 sec.	491520 nimeṣas	Śārdūla-Karṇa-Avadāna
9	0,177 sec.	486000 nimeṣas	Mānava-Dharma-Śāstra
10	0,2 sec.	432000 nimeṣas	Divya-Avadāna
11	4 sec.	21600 prāṇas	Sūrya-Siddhānta

Texts, as a rule, contain calculations of duration of a day or a year in these instants.¹⁴⁰

Chronometric model of the Sūrya-Siddhānta is based on the conception of truti, an instant, which is defined as ‘not protensive’ or ‘imperceptible’ (amūrta.) Further, it is postulated that

1 prāṇa is equal to 4 seconds;

6 prāṇas = 1 vināḍi ;

60 vināḍis = 1 nāḍikā (24 min. or ½ muhūrta);

60 nāḍis = 1 day.

The Sūrya-Siddhānta calculates the revolution of the Earth around the Sun up to the ninth digit after a decimal point (365.258756484 days, modern textbooks give us 365.2596 days, as a rule.)

There are some amazing numerical conformities between different models of the daily chronometry and between them and other Vedic figures. Therefore, the quantity of nimeṣas in a day in the Divya-Avadāna coincides precisely with the ideal quantity of syllables of the Ṛg-Veda. It confirms once again an opportunity of using the Ṛg-Veda as a daily clock. The quantity of trutis in a day according to the Artha-Śāstra is equal to three times less the mahāyuga of the Mānava-Dharma-Śāstra: $1440000 * 3 = 4320000$.

¹⁴⁰ Shardulakarnavadana. Opp. Cit. P. 126, note 93.

Besides, the latter day value is ten times more than that postulated by the Divya-Avadāna and 20 times more than the quantity of prāṇas of the Sūrya-Siddhānta.

These conformities demonstrate that models of daily time of different texts, though seeming at first sight different, actually correspond strictly with each other and, probably, were developed simply for different purposes within the same chronometric system. For example, they could correspond with different 'days' or periods of rotation of the Earth, the Sun, the Moon and the other planets.

So, 6480000 tatkaṣaṇas of the Śārdūla-Karṇa-Avadāna, as well as 486000 nimeṣas of the Mānava-Dharma-Śāstra, are multiples of 18000, revealing among themselves a ratio:

$$6480000 : 486000 = (18000 * 360) : (18000 * 27) \text{ or} \\ 360 : 27 = 13.333.$$

This designates nothing else than the amount of degrees in the annual zodiac divided into 27 nakṣatras consisting of 13.333° each.

It follows that 18000 is a certain recitative block for measurement of a day, for example, number of verses gāyatrī in a day (24 syllables * 18000 = 432000 syllables.) The number 6480000 expresses ceremonial year of 360 days ('day of the gods,') and the number 486000 represents a 27-day sidereal period or a 'day of the Moon' expressed in quantity of gāyatrī verses. The smallest time unit in this case will be equal to 4.8 sec.:

$$24 \text{ syllables of gāyatrī} / 5 \text{ syllables} = 4.8 \text{ sec.}$$

21. LATENT HARMONY OF THE VEDIC NUMBERS

Modern indology quite often shows extreme straightforwardness in interpretation of Sanskrit astronomy. At the World Sanskrit Conference in Turin in 2000 Christopher Minkovsky from Cornell University asserted, referring to primary sources, medieval Indian astronomers and modern Western historians of the Indian astronomy, such as David Pingree, etc., that the Earth in the Purāṇas appears flat, and the sky is formed by only a few hemispheres, formed by orbits of the planets and located one above another on this flat Earth.

According to his first rather confused scheme, the Earth in astronomical siddhāntas divided into six concentric continents and oceans, is in the center, and seven planets and stars rotate around it.

Absurdity of a similar interpretation is indicated, first, by that in observant astronomy, Mercury and Venus persistently follow the Sun, are visible only in the morning and in the evening on the Eastern or Western sky (the greatest distance from the Sun being 28° and 48° respectively) and, certainly, are never visible in the center of the night sky. In other words, the observer never will tell that they rotate around the Earth as the top planets – Mars, Jupiter and Saturn – do. Though, on the contrary, he can quite safely make a legitimate conclusion that they rotate around the Sun as they appear constantly to the left and to the right of it!

Second, in mythology, Pṛthivī is an open space of the night sky, its blackness reminding the ploughed ground. The ‘Earth’ here is the astronomical term with transparent sense (about Pṛthivī see the Part II.) Therefore, the concentric ‘continents’ and the ‘seas’ refer to the star sky representing only those planets, which really describe circles around the observer located on the Earth and spaces between them. At the same time, it is possible to interpret these ‘continents’ and ‘seas’ as the months of the year as their total sum is 12.

According to his second even more illogical interpretation, the

planets circulate on the orbits located above the flat Earth, under which there are still the worlds called pātālas (lit. 'Cellars' – in contemporary translation 'hells.')

When I objected it, pointing at that Pṛthivī is not the Earth, but the empyrean, the area of motionless stars which appears to a terrestrial observer as a 'celestial firmament,' he seemed confused and agreed that his reasoning about the flat ground appeared unpersuasive (as the ancient Indian poet would say, 'the son of a barren woman' or 'a horn of a hare,') however, as it seemed to me, he remained in perplexity: but how then to be with the other Puranic 'absurdities' so strongly rooted in Western indology?!

For example, how to be with definition of diameter of the 'Earth' as 500 million yojanas, which are equal to 7500000000 kms in modern interpretation or 50 AU (astronomical units or distances from the Earth to the Sun.) As a diameter of the Earth, it is nonsense, but in the context of the Solar system, it is the distance to Pluto, the most remote planet from the Earth. Hence, from this point of view the term 'Earth' designates the star sky, to be exact, the Solar system.

An another such important astronomical 'absurdity' in Purāṇas is the statement that diameter of the orbit of Sūrya (usually translated as the 'Sun') is 9000 yojanas, and its orbit circumference is accordingly 27000. Strangely enough, the diameter of the orbit of Candra (usually translated as the 'Moon') is 18000 yojanas, and its orbit circumference is 54000 yojanas (Matsya-Purāṇa, 123.6-8,) that is, it is twice as long as that of the 'Sun.'

From the common sense point of view (it is clearly visible to the naked eye that the Moon having come nearer to the Sun stands in between it and the Earth and causes a solar eclipse) and in any system of rational astronomy, the statement, that the orbit of the Sun is less than the orbit of the Moon is an absurdity, if to accept those figures literally and to take the modern ambivalent term yojana for '15 kms.'

However, let us not hasten with conclusions: the Western tradi-

tion of interpretation of the Vedas frequently happens to be so superficial that it is necessary to consider these basic concepts and numbers more attentively in the Lunar and Solar observational astronomy.

The position of the Sun was defined through the observation of the full Moon, which rather quickly shifts shutting down the light of the nearest stars. The task of precise definition within the seconds of the arch becomes complicated. For definition of the central instant of the full Moon, it is necessary to know exact duration of the synodical and sidereal months expressed mythologically with ‘fluctuating’ quantities of ‘horses’ in ‘teams’ of days in planetary periods. It is necessary to know speeds of the truly full Moon and the Moon as heavenly body in relation to stars, and also to be able to measure distances from the center of a lunar disk to the nearest seen star of the zodiac.

Orbit of Candra

The Matsya-Purāṇa emphasizes that the diameter and the orbit circumference of Candra is twice more than that of Sūrya. Hence, it is necessary to assume that the comparable, though different lunar phenomena were concerned. They might have been, for example, sidereal and synodic months or Lunar months and Lunar years, and, maybe, daily rotation of the Earth in relation to the full Moon and the annual moving of the full Moon in relation to the stars. Thus, the first ‘diameter’ is defined through the synodic month dependent on the position and distance of the Moon from the Earth, and the second one is derived from the sidereal movement of the full Moon relatively to the zodiac constellations. The same Moon is thought of as two different objects: one is located on a circumterrestrial orbit, the other is on the empyrean one, divided into twice more arc units, than the former one.

Candra (Moon) is not an abstract Moon. It is the Moon either of the bright half of the month from a new moon day to the full moon or it is the crescent moon from the third to the second Lunar quarter.

It can also represent the sidereal month, in other words, the Moon in its movement round the stars.

Sūrya also is not an abstract Sun as the majority of translators



Tops of the huge Shrirangam pyramidal complex
on the island of the Kaveri River
in honour of the nine planets

thinks, but the full ('solar') Moon. In observational astronomy, its position helps to define the position of the Sun, and, hence, its annual way as it is on one line with the Sun and the Earth. For that reason, Sūrya is metonymically the Sun. Therefore, the contradiction can be unzipped very simply: the way of the sidereal moon is measured with the help of 54 nakṣatras and upanakṣatras, and the way of synodical (solar) Moon and accordingly that of the Sun with the help of 27 nakṣatras. Then yojanas are divisions of the Moon's orbit, aren't they?

Figures '27 thousand' and '54 thousand' in connection with syn-

odic and sidereal Moon point at the zodiac, which is really described as consisting of 27 nakṣatras and 54 upanakṣatras. The ancient Vedic zodiac had been rather gracefully divided into 12 basic rāśis (the zodiacal constellations conditioned by twelve full moons in a year,) into 27 basic nakṣatras (‘lunar stations,’ conditioned by 27 days in a sidereal month,) 27 upanakṣatras (‘auxiliary stations’) – two in every nakṣatra (to mark division in days and nights,) 108 padas (‘steps’) – two in every upanakṣatra, and into 216 yāmas (‘watches’) – two in every pada. Vedic mathematical astronomy used nakṣatras and upanakṣatras depending on the character of planetary periods.

The sidereal way of Candra is divided into 54000 yojanas and in 54 upanakṣatras, one upanakṣatra includes 1000 yojanas, one pada 500 yojanas, and one yāma 250 yojanas. Thus, 1000 yojanas (‘yokes’) reminds of one thousand horses of Indra, and 250 yojanas about 250 hymns of the Ṛg-Veda in honour of Indra. That forces once again the chronometric function of the hymns addressed to Indra on our attention.

Yojana as the Mother of Vyāsa

In this connection, it is necessary to pay more attention to the etymology of the concept of ‘yojana’ as a unit of measurement. The word has apparently several connotations depending on astronomical perspective, duration of the main calendar unit such as day, month, year, and year cycle.

Though dictionaries define the term rather vaguely as 2.5, 4-5 or even 8-9 English miles, it did not designate, actually, in the Vedas kilometers and miles, in general, linear measures. Most likely, this concept belonged to the field of spherical geometry, syllabic chronometry, Vedic mythology, calendar and philosophy. It means literally ‘yoke,’ ‘union,’ ‘addition,’ ‘syllable,’ ‘proposition,’ ‘mantra,’ ‘finger,’ ‘the supreme being or spirit, parama-ātman,’ and also the name of the mother of Vyāsa, whose name definitely means ‘diameter of a circle.’ In the latter context, Yojana is, most likely,

the personification of a part of an arch consisting of some smaller units of measurement. Thus, all above meanings as diverse as they are characterize and detail the concept of yojana in its application to practice of syllabic-chronometric gauging of positions of the Moon and the Sun in their orbits.

Vyāsaḥ ('Diameter of a circle') personifies symbolical 'editor-in-chief' of the Vedas and the Purāṇas. At the same time, it is an embodiment of diameter of a circle, and, therefore, that is quite logical, its place of origin or 'mother' can be only a circle circumference or, at least, an arch of a circle. This mythologem is a strong indication of the true source of the Vedas – spherical geometry.

Though, in ordinary sense, the meaning of 'a yoke, a team of horses' has, undoubtedly, reference to 'the journey done without reharnessing of horses,' however, most likely, in the Vedic context, this concept cannot have any other sense except for 'a team of horses of Sūrya or Candra,' moving invariably in a circle. The Vedas do not contain any context having direct reference to 'yoking' of usual horses, usual people and usual events. Terrestrial images are used in them just metaphorically.

It would seem that the meaning 'finger' is a little bit at odds surrounded by divine characters, philosophical terms and chronometric concepts, but it also has quite realistic astronomical explanation. It is known that the Sun traverses 1° or two its angular diameters in a day. And that shift can be measured with the help of fingertips of the extended hand (thickness of a finger of the extended hand corresponds approximately to 48" and thickness of five fingers to 240" or 6'.) Besides, the Vedic expression 'ten fingers' in relation to Puruṣaḥ ('cosmic filler,' that is, light of the Sun and stars,) has a concrete meaning of 'ten cardinal points,' 'ten sides of the heavenly sphere.'

The meaning 'mantra' points at syllabic chronometry. Sanskrit authors usually determine yojana through the other mysterious concept of krośa (lit. 'shout'): 4 or 8 krośas are equal to one yojana

(mantra.) In the context of Vedic syllabic chronometrics, 8 krośas are rather significant (see Part II.)

If in the Vedas and Purāṇas, krośa was used in the sense of 'shout,' then one krośa, quite probably, could be equal to one syllable and, accordingly, to one nimeṣa, 'instant' (Divya-Avadāna,) $3\frac{1}{3}$ trutis (Artha-Śāstra) or, for example, to ten trutis (according to one of my previous reconstructions.)¹⁴¹ Eight krośas or one yojana thus will make 8 syllables, one pada or foot of the gāyatrī meter, the main Vedic mantra. One yojana expressed in seconds will be equal to 1.6 sec.: $86400 \text{ sec.} / 54000 \text{ yojanas} = 1.6 \text{ sec.}$

Having supposed that at recitational speed of 5 syllables per second, 432000 syllables of the Ṛg-Veda can be read exactly in one full day, we find out that one syllable is equal to 0.2 sec., and 8 syllables make 1.6 sec. In other words, one poetic pada, foot of a verse, corresponds to one chronometric yojana.

54000 yojanas, being multiplied by 8 krośas, are equal to 432000 akṣaras or syllables. This was, according to one my estimation, the quantity of trutis exactly in one full day, according to another one, in three days and nights. The latter variant multiplied further by 10 trutis, makes accordingly 4320000 trutis or one month of Candra. Yojana here means one kalā ('minute,') equal to 48 sec. Kalā as division of time, in fact, is differently computed (one minute, 48 sec., 8 sec.) At the same time, it has a meaning connected with a circumference – the 60th part of one 30th part of zodiacal sign, that is, $0.01666...^\circ$ or $1' (= 60 \text{ .})$

At the recitational speed of 1.666... syllables per 1 sec., 8 krośas make 13.333... sec. Ten kalā make 480 sec. and correspond to 12 gāyatrī mantras or one hymn. 5400 such hymns produce 30 days and nights.

A terrestrial observer turns on 360° (21600' or 1296000"). In this context, one yojana can be determined as 24" of the arch:

¹⁴¹ Kṣemendra, Opp.Cit. P. 290.

$$1296000'' : 54000 = 24''.$$

It is the distance, to which the terrestrial observer is displaced according to daily rotation of the Earth in 1.6 sec. or one pada of the gāyatrī verse (86400 sec. / 54000 = 1.6 sec.) In chronometric model of the Artha-Śāstra (in which truti, equal to 0.06 sec., corresponds to a turn of the Earth on 0.9'',) the interval of 1.6 sec. is one third longer than the unit called kāṣṭha (1.2 sec.,) and in Divya-Avadāna, 8 krośas correspond to eight nimeṣas (instants.) Probably, in the Vedas these eight nimeṣas were called eight krośas and corresponded to eight akṣaras (syllables.)

As one pada of the 8-syllable gāyatrī meter corresponds to a turn of the Earth around its axis on 24'', this interval of 24'', might have represented the basic unit of measurement of daily movement of the Earth, monthly rotation of the Moon and annual rotation of the Sun. The 24-syllable gāyatrī mantra consisting of three feet is equal to 4.8 sec. ($\frac{1}{10}$ of kalā) or to four kāṣṭhas, during which the Earth turns on 72'' or one and a half finger.

The kalā equal to 48 sec. reveals a surprising symmetry between chronometric mantras in the gāyatrī meter and the Vedic lunar chronometry. So, for example, one average hymn of the Ṛg-Veda consisting of 10 mantras in gāyatrī is equal to 1 kalā:

$$10 \text{ mantras} * 24 \text{ syllables} / 5 \text{ syllables} = 48 \text{ sec.}$$

$$210 \text{ mantras (21 hymns)} \text{ make accordingly } 21 \text{ kalās:}$$

$$210 \text{ mantras} * 24 \text{ syllables} / 5 \text{ syllables} = 1008 \text{ sec.};$$

$$1008 \text{ sec.} / 48 \text{ sec.} = 21 \text{ kalās.}$$

One prāṇa (4 sec.) is a turn of the Earth on 1', one kalā corresponds to one average hymn in gāyatrī and marks a turn on 12'. Five padas forming the paṅkti meter are equal to two prāṇas:

$$8 \text{ syllables} * 5 \text{ padas} = 40 \text{ syllables};$$

$$40 \text{ syllables} / 5 \text{ syllables} = 8 \text{ sec.}$$

Alternatively, 2 prāṇas also correspond to a turn of the Earth on 2'.

A turn of the Earth on three degrees corresponds to 3600 syl-

lables:

$3600 \text{ syllables} / 5 \text{ syllables} = 720 \text{ sec.};$

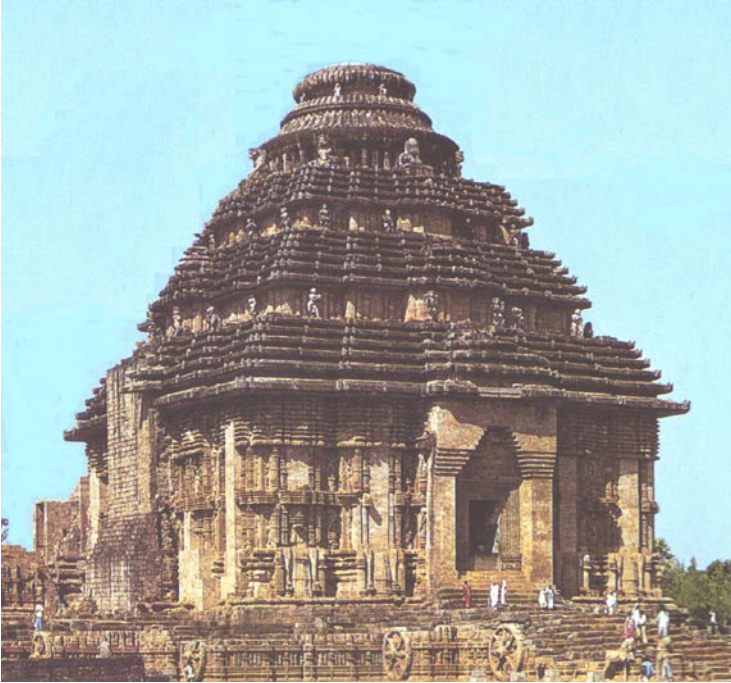
$720 \text{ sec.} / 60 \text{ sec.} = 12 \text{ minutes.}$

This interval is equal to 150 mantras in gāyatrī, to one reading of fifteen average hymns.

It is not difficult to find conformity between different gauging of rotation of the Earth and all other Vedic chronometric meters.

The Cycle of hymns to Agni

The Vedic devas, gods or celestials are divided into three groups:



Surya temple

heavenly, intermediate and terrestrial. Agni (the Moon,) according to this division, belongs to celestials of the 'Earth' and is the lowest among devas (lunar phases or planets.) Between Agni and Viṣṇu

(Saturn,) the highest deva, all the others are placed. To Agni in the Ṛg-Veda, 200 hymns are addressed. These hymns could have been related to the daily rotation of the Earth. Approximate calculation shows that 200 hymns to Agni, if they are exclusively in gāyatrī, will be equal to a period of time, which is needed for the Earth to turn on 40°:

200 hymns * 10 mantras = 2000 mantras;

2000 mantras * 72" = 144000 ;

144000" : 60" : 60' = 40°.

However, as there are also mantras in longer meters, these 200 hymns correspond to a larger period, hypothetically, to one eighth of the daily revolution of the Earth that reminds us of a division of the Ṛg-Veda into eight aṣṭakas, and day into eight watches (yamas.)

The Cycle of Hymns to Indra

Five gāyatrī verses (consisting of 3 padas and 24 syllables) or 120 syllables forming a division of the text called varga are equal to 24 seconds of time and correspond to a displacement of the Sun on 1". 120 verses in gāyatrī (12 average hymns of 10 mantras or 2880 syllables) are equal to 576 seconds of time and correspond to a displacement of the Sun on 24":

24 sec. * 24" = 576 sec.

The sun passes 1" in 24 sec., and 24" in 24 sec. * 24" = 576 sec. It makes 144 prāṇas of 4 sec., and also corresponds to a quantity of the syllables generated by the Sanskrit alphabet:

16 vowels * 36 consonants = 576 syllables.

This syllabic system underlies the Tantric psycholinguistical chronometry and the Vedic printed code (see Part III.) Let us assume that the number 576 sec. is the time in seconds, in which the Sun passes one yojana or 24" of the ecliptic. If quantity of seconds of time in one year to divide by 576 sec., we get 54000 (2 * 9 * 30 * 100.)

It is curious that on the Proto-Indian seals, the number 54.000.000 (2 * 9 * 30 * 100000) is met. If this number to multiply by 576 and

10000, we will get the Life of Brahmā.

Approximate calculation shows, that, 250 hymns to Indra, the god of the full Moon and the Sun, if all of them are in gāyatrī, would contain 110000 syllables ($250 * 10 * 44 = 110000$ syllables) corresponding approximately to six hours. These six hours are equal to time, in which the Sun turns relatively to the stars on 15' :

$$\begin{aligned} 110000 \text{ syllables} : 120 \text{ syllables} &= 916.6''; \\ 916.6'' : 60'' &= 15'. \end{aligned}$$

The recitation of the Ṛg-Veda corresponding to one rotation of the observer relatively the Sun on 360°, and the Sun relatively the stars on 1°. Hence, the turn on 15' corresponds to ¼ of a day or to turn of the terrestrial observer on 90°.

The way of the Sun is divided into 108 padas ('steps.') The Sun spends 288000 sec. for traversing one pada consisting of 3.333...° (200' or 500 yojanas.) The figure '288000' is equal to the amount of syllables in the Yajur-Veda and makes 3.333... days. Division on solar padas is ideally fit in the concept of the Life of Brahmā, which can be presented as the following equation:

$$\begin{aligned} 4.320.000 \text{ (trutis in a day)} * 4.320.000 * 5 * 3,333... \text{ (days)} &= \\ &= 311.040.000.000.000 \text{ trutis}; \end{aligned}$$

Or in other equation:

$$\begin{aligned} 4.320.000 \text{ trutis} * 200.000 \text{ years} * 108 \text{ padas} * 3,333... \text{ days} &= \\ &= 311.040.000.000.000 \text{ trutis}. \end{aligned}$$

Otherwise, the Life of Brahmā represents amount of trutis in 200000 years of 360 days. If 4320000 trutis are equal to three days, then the Life of Brahmā will make 600000 years.

One sign of the solar zodiac contains 9 padas. The sun crosses the half of a sign corresponding to a half-month in 15 days or 1296000 seconds. The quantity of the arc seconds in a circle and the amount of trutis in the Treta-Yuga, which is the sum of the Dvapara-Yuga and the Kali-Yuga. All the yugas are multiples of the syllable quantities in the four Vedas. The Dvapara-Yuga is equal to three amounts of syllables in the Yajur-Veda ($288000 * 3 = 864000$.) and Kali-Yuga

is equal to 432000 trutis, that is, $288000 * 1.5$. The interconnection of all the elements of the Mahā-Yuga and the four Vedas with the movement of the Sun through the ecliptic had been perfectly adjusted in this system.

The Cycle of Hymns to Soma

In relation to stars, the Moon moves approximately with a speed $13.333...^{\circ}$ per day ($360^{\circ} / 27 = 13.333...^{\circ}$.) As there are 1440 minutes in a day, it passes one degree in 108 minutes (one hour and 48 minutes or 6480 sec. Equal to 2.25 muhūrtas,) and one second of an arch in 108 sec. This period, probably, corresponds to reading of the ninth maṇḍala (consisting of 114 hymns and devoted to Soma, the god of sidereal Moon.)

Approximate calculation shows, that, having accepted an average hymn to be equal to 10 mantras, and the average meter equal to anuṣṭubh (32 syllables,) 114 sūktas of this maṇḍala will contain 36480 syllables ($114 \text{ sūktas} * 10 \text{ mantras} * 32 \text{ syllables} = 36480 \text{ syllables}$,) which pronunciation will require 121.6 minutes:

$36480 \text{ syllables} / 8 \text{ syllables} * 1.6 \text{ sec.} = 7296 \text{ sec.};$

$7296 \text{ sec.} / 60 = 121.6 \text{ minutes.}$

It is a little bit more than necessary and more careful calculation may give the quantity of syllables in all 114 hymns in different meters as it is expected, namely, 777600 syllables corresponding to 108 minutes.

Orbit of Sūrya

If we divide the orbit of Sūrya expressed in yojanas into quantity of padas, we shall find out that every pada contains $27000 : 108 = 250$ yojanas (exactly as many as the number of hymns devoted to Indra, the full Moon, in the Ṛg-Veda.) In this case, yojanas remind teams of Indra's horses. Their reading demands six hours ($\frac{1}{4}$ of a day or turn of the Earth on 90° .) Aren't these hymns not only means of

definition of the daily moving of a terrestrial observer in relation to the full Moon and the Sun and means of tracking the annual course of the full Moon and accordingly the Sun through minutes of the ecliptic, but also means of measurement of time spent by Moon on passage of one of 108 padas? Really, if 250 hymns are equal to six hours and mark the passage of one pada, then the Moon passes 108 padas in 648 hours (6 hours * 108 = 648 hours.) This period corresponds to 27 days, that is, to a sidereal month:

648 hours / 24 hours = 27 day.

108 cycles of hymns to Indra cover this cycle:

108 * 250 = 27000 hymns.

108 is a sacred figure: such is the quantity of basic Upaniṣadas, basic Tantras, and the amount of beads in big rosary of Buddhists and Hindus. The other quantities are 9, 18, 21, 42, 50, 54 and 81 and are connected with important figures of the Vedic astronomy.

As there are 12000" in one pada (200' * 60"), it follows that one yojana contains 12000" / 250 = 48" or 0,8', which the Sun passes in 1152 sec. (19.2 minutes,) and Moon in 86.4 sec. (it is one thousandth of a day, reminding one thousand horses of Indra)! The day consists of 86400 sec., the year of 360 days, therefore, of 31104000 seconds. It is one ten-millionth of the Life of Brahmā. If the Life of Brahmā is calculated in seconds, it will be equal to 10 million years, and if in trutis (0.02 sec.,) it will be equal to 200 thousand years.

In a ceremonial year, the full Moon or the Sun passes 250 yojanas or 1 pada in 3.333... days or 288000 sec.:

31104000 sec. / 108 padas = 288000 sec.

As we remember, it is a number of syllables in the Yajur-Veda and seconds in a basic arch of Brahmagupta (4800' * 60" = 288000".) It is equal to 40°.

Important Vedic figures enter constantly in chronometric and geometrical harmonious formulas reminding the phenomenon of śleṣa ('fuse of meanings,' polysemy) in Sanskrit poetry... Poetry of numbers! The impression is that the ancient Indian mathematician

manipulates with huge astronomical numbers as though smiling, everywhere importing double, triple and even polysemic meanings! This sensation amplifies as you start to realize connections of exact astronomical calculations with phonetics and metrics of the Vedic text. It is highly probable that principles of the Vedic music twisted in the majestic theory of the ancient Indian theatre have also mathematical-astronomical codes!

Summing up, it would be desirable to note that the numbers cited by Manu, the Artha-Śāstra, the Divya-Avadāna and the Purāṇas which first could seem hyperboles deprived of any real sense, find more and more concrete meaning. Connection of astronomical yojanas, quantities of syllables in the Vedic Saṁhitās and time units in subdivisions of the Life of Brahmā with padas of the ecliptic become so obvious that the contradictions attributed to ancient books by modern translators turn to be the ridiculous illusions generated by total misunderstanding of ancient astronomical purports and by absolutely wrong interpretation of mythological concepts.

If to hold fast to the internal logic inherent in ancient observational astronomy, we will get the same numerical values fixed by tradition in mythologems, quantities of syllables and direct instructions of the Vedas.

It is obvious that ancient scientists used different models of chronometric recitation, most appropriate to the character of observations. We have examined only those models, which seemed to be the most probable; to encompass all of them and to analyze them in the context of concrete scientific calculations of ancient astronomers, which are fixed in Sanskrit texts on mathematical astronomy is a task of future researches.

The inherent harmony of various lines of numbers, coordination of all calculations with exact observation, careful choice of psycholinguistic, physiological, ethical and aesthetic details, figurativeness, syncretism and cosmism testify of long tradition of observation, perfecting of terminology and coordination of astronomy and chro-

nometry with breath, phonetics and metrics! How many hundreds thousand years did these developments take? It is hard not to yield to temptation to exclaim with delight with an ancient Indian wise man: ‘Maybe, he who dwells on the highest sky knows this. And, maybe, he does not know?!’

Brahmā – the Creator of the World

‘Some foolish men declare that a Creator made the world. The doctrine that the world was created is ill-advised, and should be rejected. If God created the world, where was he before creation?... How could God have made the world without any raw material? If you say He made this first, and then the world, you are faced with an endless regression... Know that the world is uncreated, as time itself is, without beginning and end. And it is based on principles.’

Jīnasena ‘Mahāpūraṇa’

The word Brahmā (‘Great, Big’; ‘Speech’; ‘Veda,’ ‘pray’) designates the creator of the world and enters into the names of his wife Sarasvatī and his sons such as Marici and others, as also into the surnames of most important Vedic gods: Viṣṇu, his wife Lakṣmī and son Anirudha, Agni, Śiva and his son Kārtikeya, Indra, Manu, Narada, Kāma, the star Rohinī and other lunar and night deities.

Association of Brahmā as a loka-pāla (‘the pastor of the part of the firmament’) with zenith can be interpreted as the indication of the beginning of the year and the spring equinox, when the Moon ‘walk very high’ (only in ‘zero approximation’ it moves close to ecliptic!) or as an indication of a summer solstice on the Northern tropic, when the Sun is in zenith. In spring, after the Sun crosses the point of the spring equinox, the ecliptic is placed on the evening sky above the heavenly equator (in the autumn the picture will be opposite.)

Brahmā is one of the faces of Trimurti (‘Three-headed’ Hindu Trinity) represented by the Creator, the Preserver and the Destructor in one person. There is good reason to identify Brahmā with the solar year, Viṣṇu with the ceremonial one, and Śiva with the lunar one.

Solar System as Family of Brahmā

Descriptions of the creation of the ‘world’ in Sanskrit texts differ considerably. According to the ‘Laws of Manu,’ the universe in the beginning was cast in a gloom unbroken. The self-existing Śiva appeared as light, having created the ‘sea’ of light, in which he placed ‘a golden germ’ (Hiraṇya-Garbha, ‘fire,’ ‘celestial’ identified by tradition with the 14th day of the dark half, that is the new moon of the month of Bhādrapāda (August – September.) The golden germ developed inside the lotus evolved from the navel of Viṣṇu, the embodiment of Śiva, after the creation of the heavenly ‘sea.’ Then the ‘golden germ’ in due course destroyed the ‘golden egg,’ which top half became Dyaus (light) and the bottom one Pṛthivī (‘full’ night, darkness.) Subsequently, the ten sons of Brahmā were born who engendered all other celestials:

1) Marici (‘Shining’) gave birth to Kāśyapa (‘Turtle’ – the full Moon and, accordingly, the Sun,) which, from thirteen daughters of Dakṣa ‘begot’ thirteen sorts of the lunar phenomena (‘star,’ ‘lunar,’ ‘solar’ months, monthly eclipses, lunar phases and so forth);

2) Atri (‘Eater’) born from the eye of Brahmā, produced from Anasuya (‘Night’) the Moon Soma (sidereal Month,) to whom twenty seven daughters of Dakṣa (27 nakṣatras) were given as wives, and Dharma (‘establishment’ of the solar system or Saturn,) which wives are ten other daughters of Dakṣa (embodiments of ten constellations and ten three-year periods of Saturn);

3) Aṅgiras (‘Coal,’ Mars) appeared out of the lips of Brahmā or out of his seed fallen into the Fire and gave rise to the clan of Aṅgiras, among which the most significant are Agni (the first full Moon day,) Indra (the second full Moon day,) Soma (the New Moon day,) Rudra (the New Moon day,) Bṛhaspati (Jupiter,) Samvarta (sidereal period of Jupiter,) and Utathya;

4) Pulastya engendered vanaras (‘monkeys,’) almost certainly, planets, kinnaras (‘people’ with horse heads,) rakṣasas (half-men-

half-animals,) probably, morning and evening twilights, which are depicted as ‘enemies of the gods’ reminding the Greek ‘twilight of the gods’;

5) Pulaha gave birth to kim-puruṣas (‘low men, horse-head men,’) ‘lions’ and ‘fallow-deer,’ in all probability, symbols of lights around the Sun and the Moon during eclipses;

6) Kratu (‘sacrifice,’ ‘year,’ ‘force’) created satellites (planets) of the Sun;

7) Dakṣa (the ‘Hefty,’ lunar Zodiac,) was born out of the right thumb of Brahmā (his wife Vīraṇī appeared as Night from the left thumb) and was the father of a thousand sons (this circumstance relates Dakṣa to Agni who has one thousand eyes, besides, ‘Dakṣa’ is a nickname of Agni and Soma) and sixty daughters (rāśi or solar signs and nakṣatras or lunar signs: 13 (zodiac signs) were given to Kāśyapa (synodical Month and the Sun,) 27 to Soma (sidereal Month,) 10 to Dharma (Saturn,) 10 to Manu (Sūrya, the Sun.) The latter ‘marriage’ specifies the solar year as consisting of 10 months;

8) Bhṛgu (‘Bright,’ Venus) came out of the heart of Brahmā and gave life to Śukra (morning Venus,) the instructor of Kāśyapa’s children from Diti and Danu, and Cyavana (‘Falling down’ waning Moon, or evening Venus);

9) Dhatṛ (‘donator,’ the Creator) supports life and health;

10) Vidhatṛ (‘donator,’ the Creator) symbolizes an irreversible course of time, destiny, the Creator of everything (Viśvakarman,) the Light, and Time.¹⁴²

Thus, among sons of Brahmā the monthly and annual zodiacs, and planets, among which five most important – the Sun, the Moon, Jupiter, Saturn, Venus – are directly named. It will be a right conjec-

¹⁴² Mahābhārata /Tr. and Comm. V. I. Kalyanov. Book 1, Moscow – Leningrad, 1950; Book 2, M., 1962; Book 4, Leningrad, 1967; Book 5, Leningrad, 1976; Book 7, M., 1992; Tr. and Comment by Y.V. Vasilkov & S.L. Neveleva, Book 3, M., 1987; Mokṣadharmā: Foundation of Liberation. Tr. and Comm. By B. L. Smirnov. Ashhabad, 1962. Book 1. P. 174–182.

ture that Pulastya and Pulaha having similar posterity in the form of men-horses and rakṣasas (demons,) personify two nodes of the lunar orbit – Rāhu and Ketu, in which the eclipses, unfavorable demonic phenomena, take place. Hence, we have to identify Mercury and Mars with Dhatṛ and Vidhatṛ.

The further confirmation of Brahmā's connection with the Solar system are images of his spouse and son Priyavrata. In order to incessantly contemplate dancing of Kāśyapa's children, apsaras (heavenly maidens-constellations) and gandharvas (heavenly vīṇā or lute players, phases of the Moon,) games and fights of inhabitants of heaven (first of all, war of the sons of Aditi personifying full moons, Diti and Danu personifying new moons and Draconian nodes of the lunar orbit,) as also the movements of the Moon to the left and to the right (great 'actions,' ceremonies or 'sacrifices,') straight line and loop movements of the other six planets and eclipses of the Sun and the Moon, Brahmā remaining motionless on his sitting (a lotus or a white swan) created for himself five faces on all sides and the top of the head (five seasons of 73 days.)

His own uncountable manifestations, his creation, the star world, has appeared before his eyes as Śatarūpā, a woman of infinite beauty, endowed with a 'hundred images.'

She became his spouse more known under the names of Savitrī ('Bright,') She was a personification of the solar-lunar zodiac of 27 constellations, and is legendary for being capable to return her 'husband,' the Moon or the Sun, whose life was taken away by Dharmarājā, king of the lunar empire, Saturn.) Among her other names are Mead-radiating, Sarasvatī ('Pondlooking,') gāyatrī ('Singing,') Brahmanī ('Big,' 'Great,' 'Eloquent,') Durgā ('Far-going,') Vāc ('Speech,') Rohinī ('Increased, Adult,' identified usually with the first of 27 lunar constellations and called the most favorite Moon's consort.) After the marriage, hundred years later, Śatarūpā gave birth to two sons: Svayambhuva-Manu (or Virāj) and Priyavrata. One is identified with Sūrya (the Sun, the full moon,) the other with the

seven planets!

Having found out that Brahmā tempted his daughter (one of the names of Śatarūpā is Brahmā-Putrā (Daughter of Brahmā,) Śiva chopped off one of his heads. These mythologems show that a lunar year of 12 months symbolized by Śiva corresponds to a more harmonious division of the solar year into four seasons, though the solar year is easier and with no remainder divided into five seasons of 73 days ($73 * 5 = 365$.) One of hints on symbolical character of the number '73' is the quantity of verses in 'Sāṅkhya-kārikā,' listing all ontological elements of the chronocosmos.

Further proofs of this solar-lunar character of the dispute between two mighty gods are found in other Puranic records. It is said that the quarrel was incited by the arrogance of Brahmā who desired to become the father of Śiva. His desire was satisfied by Śiva having been born from a drop of blood (a morning dawn) from the forehead of Brahmā, who, brushing away the sweat of frenzied self-sacrifice (tapasa, 'ascetic training') had scratched himself with his nail – the half moon. The scratch caused sobbing, therefore Śiva, who appeared out of blood drop fallen into fire is called Rudra ('Red' or 'Sobbing.') Brahmā received a nickname Pitāmahā ('Great Father,' the Grandfather,) but Śiva cut down him the fifth head for this humiliation ('Mātsya-Pūraṇa,' 183.84-86.)

'Padma-Pūraṇa' ('Sṛṣṭi-kāṇḍa,' 15) indicates as the reason of severing the fifth head its intolerable shine, having menaced to ruin the universe, having overshadowed all the stars, which had addressed to Śiva for help. Śiva was born as Rudra, the son of Brahmā, with a crescent in his forehead and cut off with his 'nail' the fifth head shining brightly with arrogance and showing desire to see Rudra bowed to the ground and asking mercy.

Though Brahmā (the Sun) eclipsed the entire universe and filled it with his sounding of the four Vedas (this is one more indication of the esoteric connection of the Vedic mantras with the Sun and astronomy) received from Śiva he is accused of falsity and hypocrisy

generated by his arrogance and aspiration to the superiority. Great Luminary (Mahā-Deva) called also Great Time (Mahā-Kāla) forbade his worship for that Brahmā told a lie, as if competing with Viṣṇu, he could reach on his ‘swan’ the top edge of the fiery genital organ of Śiva (the edge of the Solar system’s diameter.) Brahmā is worshiped only once in a year on the full moon of the month Māgha – January – February, when the full moon enters into the constellation of Maghā (stars alpha, eta, gamma, zeta, mu, epsilon of the constellation of Lion.) Two thousand years B.C.E., it meant a winter solstice and the New Solar Year. The work devoted to everyday or worldly wisdom (lokāyata) attributed to Brahmā bears also a seal of hypocrisy.

All this allows connecting Brahmā with the bright part of the month consisting of six five-day weeks and Śiva with the six-day week of a new moon anticipated and ended by occurrence of a sickle Moon. Six-day weeks are repeatedly mentioned in the Vedas (30 horses of Indra are harnessed in five teams of six – III.55.18,) in the Mahābhārata (30 rivers-nights are divided into two halves with further subdivisions in five; 30 fires are also divided into 15 easily identified with nights of the bright half of the month, and 15 nights of the dark half, which are thieves of the light sacrifice of devas, Luminaries.)

The Period of Life of the Great World

‘A millennium before Europeans were willing to divest themselves of the Biblical idea that the world was a few thousand years old, the Mayans were thinking of millions and the Hindus billions.’

Carl Sagan

The Life of Brahmā (the Great World or our galaxy and planets) personifying, hypothetically, a large planetary coordinating period, is described in Purāṇas as the period between two full convergences of seven ‘stars’ (Sūryas) in one body and their subsequent division into seven initial stars. This period appears at the first sight as incredibly big:

10 Yugas (yokes) of 432000 ‘years’ make one Mahā-Yuga (the

big yoke);

71 Mahā-Yugas make one manavāntara ('Interval' of Manu);
14 Manavāntaras make a 'Day of Brahmā';
the 'Night of Brahmā' lasts as much as his Day;
both form 28 Manavāntaras;

such 360 'Days' form one 'Year'; and 100 such 'Years' form
the Life of Brahmā of 309173760000000 'years' (sometimes 14
manavāntaras are replaced with 1000 Mahā-Yugas making the Life
of Brahmā equal to 311040000000000 'years'.)

The figure '432000' is significant being the quantity of syllables
of all 1028 songs of the Ṛg-Veda, being met also in ancient Greek
astronomical texts, where it is related to the duration of the 'Great
Year' (time, in which all planets converge in one point, forming in a
place of their convergence the 'Great Fire' and in the opposite part
of the universe the 'Great Flood.')

Recognizing that the definition of a Mahā-Yuga is anticipated
in the Mānava-Dharma-Śāstra by a detailed description of the time
units smaller than fragments of an instant, I have assumed that a
Mahā-Yuga represents a description of a day in parts of an 'instant'
(nimeṣa.) Similar calculations are met across in astrological texts of
the Divya-Avadāna, the Śārdūla-Karṇa-Avadāna, the Purāṇas.¹⁴⁴

If to admit that 1 kaṣṭhā = 15 nimeṣas (as in Viṣṇu-Purāṇa, Ch. 3,
part.1, whereas in the Artha-Śāstra 5 nimeṣas, in the Śārdūla-Karṇa-
Avadāna 16 nimeṣas, in the Mānava-Dharma-Śāstra 18 nimeṣas,) and
move further as in the Artha-Śāstra, than one day in instants
will look like:

$$\begin{aligned} & 2 \text{ (trutis)} * 2 \text{ (lavas)} * 15 \text{ (nimeṣas)} * 30 \text{ (kaṣṭhās)} * \\ & * 40 \text{ (kalās)} * 2 \text{ (nāḍikās)} * 30 \text{ (muhūrtas)} = \\ & = 4320000 \text{ (trutis)} = 1 \text{ day.} \end{aligned}$$

¹⁴³ Waerden, Van der B. L. The Birth of Astronomy... Opp. Cit. P. 125-128.

¹⁴⁴ Shardulakarnavadana. Opp. Cit. P. 127. Note. 94-95.

Then the Life of Brahmā will make:

$$71 * 14 * 2 * 360 * 100 = 71568000 \text{ (days.)}$$

This figure is related to all the periods of all known planets.

We see some probable sources from which this number could have been inferred.

The first one might consist in that the lunar period of 248.5 days specified in the 'Paitamahā-Siddhānta' ('the Canon of the Grandfather,' an astronomical composition ascribed to Brahmā and included in the 'Panca-Siddhāntikā' of Varahamihira, the astronomer of the VIth century C.E.,) was multiplied by the 25-year period of the Moon, and by 10 periods of Venus of 1152 years (this great period of Venus was known to the Babylonians as a ratio 720 synodical periods of Venus = to 1151 solar years.) Thus, 7205 synodical periods of Venus are equal to 11520 solar years.

The second way could be the following: ancient Indian astronomers having developed a decimal code applied it to calculation of the periods of planets and their coordination.

From the multipliers of the number of days in the Life of Brahmā, it is possible to create a huge quantity of numbers, which will be its dividers for it represents: $8! * (5 * 355)$, that is, 8 factorial of times number of days in five sidereal lunar years or in the other record:

$$1775 \text{ days} * 2 * 3 * 4 * 5 * 6 * 7 * 8 = 71568000 \text{ (days.)}$$

The third opportunity consists in that the Life of Brahmā is a product of multiplication of 248.5 (days of the least lunar period,) 45 (quantifier for the coordination with Draconian months) and 6400 years of the big period of Venus (= 4003 synodical revolutions.)¹⁴⁵

Calculations have revealed that the number '71568000 days' is multiple of the quantities of sidereal and synodical periods of all the basic planets (including even Uranus and Neptune!) sometimes with precision up to millionths of a day!!!

¹⁴⁵ Waerden, Van der B. L. The Birth of Astronomy. Opp.Cit. P. 122–123.

Table 15.

Number of planetary periods in Life of Brahmā

Periods	Number of revolutions	Period in days according to Life of Brahma	Modern values of planetary periods
Sun's years			
anomalistic	195937	365.26	365.2596296
sidereal	195939	365.25653	365.25636
tropical	195947	365.24162	365.2421988
draconian	206474	346.61991	346.6200310
Moon's months			
sidereal	2619460	27.321661	27.321661
synodical	2423521	29.530587	29.5305882
anomalistic	2597325	27.554503	27.5545
draconian	2629995	27.21219	27.21222
Mercury's periods			
sidereal	813559	87.969034	87.969
synodical	617605	115.879890	115.880
Venus's periods			
sidereal	318390	224.78092	224.781
synodical	122565	583.91873	583.92
Mars's periods			
sidereal	104178	686.97805	686.98
synodical	91761	779.93918	779.94
Jupiter's periods			
sidereal	16521	4331.9411	4331.9404
synodical	179422	398.88085	398.88
Saturn's periods			
sidereal	6651	10760.487	10760.452
synodical	89288	378.09052	378.09
Uranus's periods			
sidereal	2332	30689.535	30688.839
synodical	193605	369.6598	369.66

Neptune's periods			
sidereal	1189	60191.757	60194.248
synodical	194754	367.47897	367.48

If to equate a mahāyuga to three days, then the Life of Brahmā will be equal to 587840 tropical years, and all the planetary periods will be multiples of the Life of Brahmā with absolute accuracy!

The first variant of the Life of Brahmā is approximately 119 times as much, and the second one is 357 times (number is characteristic of the Proto-Indian alphabet – see the chapter on a printed code) the number ‘601730’ met in the ‘Bible’ (‘Numbers,’ Ch. 26.51,) in which I also see an exact Great Year.

The Biblical Great Year was also designed in days for all the months and planetary periods (it contains 6840 sidereal periods of Mercury, 2677 those of Venus, 876 those of Mars, 139 those of Jupiter, 56 those of Saturn, 1698 lunar years, 1736 draconian ones; and synodical planetary periods, synodical months and solar years look better in this cycle as half-cycles.

The bigger period of the Life of Brahmā in instants as you have seen above (Table 9) is based on the 60-year period of Jupiter and is another key to a printed code of the Proto-Indian Vedic civilization.

Life of Brahmā in Different Chronometric Units

Earlier, we have established that astronomically big number of years of the existence of the universe named the Life of Brahmā is expressed in instants and represents a great coordinating period of various solar years, lunar months, synodical and sidereal periods of the basic planets.¹⁴⁶ We shall note that the most harmonious results were got in accord with the first, third, fifth and sixth chronometric models (Table 11.)

If to interpret literally the data of the Devī-Bhagavata-Purāṇa, then duration of a day expressed as 69984000000 alpa-kalās means that time was calculated in ten trillionth of a second, and the longer Life of Brahmā embraces only 12 solar years and two months (4444,444... days,) which is only three months more than the sidereal period of Jupiter. You will see other confirmations of that the Life of Brahmā had direct relation to cycles and subcycles of Jupiter, who, obviously, not casually appears in myths as the instructor of the devas. Curiously, one of the quantities of mantras of the Atharva-Veda is rather close to this number and equals 4432 ($12 * 365.25 + 49$.)

When we take for initial value the number 2332800000 trutis in a day, then the Life of Brahmā corresponds exactly to 365 years!

I applied the number Life of Brahmā as an original touchstone of the Vedic hermeneutics having experimented with all chronometric models and having received remarkable results for the coordination of the periods of all the planets, when mahāyuga (4320000 trutis) is equal to one or, especially, three days. Then the Life of Brahmā has been successfully used as a key to decipherment of the Vedic mantras in a ternary code.

Now, in the light of the comment of Praśastapada to Vaiśeṣika-Sūtra, it is possible to tell with confidence that the Life of Brahmā

¹⁴⁶ Kṣemendra. Opp. Cit. P. 288–292.

could represent a period of 285 tropical years measured in lunar days or tithis, which were calculated in milliardth of a second! This period encompasses three well-known Vedic 95-year cycles (see the chapters on devatās and monthly-dedicatory code.) A lunar day is equal to $\frac{1}{30}$ of a synodical month and approximately 1.0158958, 1.015914 or 1.0159 times less the solar day (the difference between these numbers is caused by that approximation, with which we take the synodical month and round off the result.) The least time unit in the Vedic philosophy vaiśeṣika, according to B. Seal, is defined as $\frac{1}{33750}$ (= 0.00002963) sec.¹⁴⁷

If to adjust the least instant of time to 0.000029614 sec. and the factor to 1.015914, the smaller Life of Brahmā makes exactly 285 years of 366 days.

If to assume, that the least time unit could be equal to 0.0000295521 sec. or 0.00002955348 sec., we have precisely 285 tropical or exactly 285 anomalistic years.

Having divided the smaller Life of Brahmā into 285 years, 86400 sec. the factor 1.0158958 and having multiplied by 0.0000295521 sec., we get duration of a tropical year:

$$309173760000000:285 : 86400 : 1.0159 * 0.0000295521 = \\ = 365.2426.$$

If the least time unit was equal, say, to 0.00002955348 sec., and the factor of the lunar day was 1.0159, we get exactly the value of the anomalistic year: 365.259645 days.

It is only 0.000015 day or 1.3 sec. more than modern value. That means occurrence of a mistake of one day in 66666.666 years! As Swamikannu Pillai observes, ancient Indians preferred namely anomalistic year, which is important for definition of a new moon and sunrise. The Sūrya-Siddhānta determines it as 365.258756484 days, only 0.001 day less than the modern value (a mistake of some days occurs in 4-5 thousand years.)¹⁴⁸

¹⁴⁷ E. I. Gosteeva, Opp.Cit. P. 85.

The Cycle of Seven Ṛṣis

As 6480000 trutis can be interpreted as one year, 2332800000 trutis of the Devī-Bhagavata-Purāṇa can represent 360 years:

$$2332800000 \text{ trutis} / 6480000 \text{ trutis} = 360 \text{ years.}$$

The 'Heavenly Year' of the Period of the Seven Ṛṣis is defined namely as 360 solar years.

This period is word for word defined in all the Purāṇas as a cycle of 2700 solar years or 7.5 'Heavenly Years' of 360 solar years (30 years correspond to a 'Heavenly Month' or to the sidereal period of Saturn.) It is esteemed that the constellation of the Seven Ṛṣis or the Big Dipper stands in each of 27 nakṣatras for hundred years.

Number 69984000000 alpa-kālas accordingly can express 30 times greater period – 10800 years (four periods of Seven Ṛṣis or 360 'heavenly months,' corresponding approximately to the periods of Saturn.) As you will see below in the chapter about Mahābhārata's chronometry, its troop population equates also 10800.

Summing up this excursus into the Vedic world of infinitesimal and indefinitely big numbers, it is necessary to note that the Vedic astrophysical system of measurement of space and time was governed by the same principles, as mathematical system of coding big numbers.

The Vedic numbers-mantras act according to a uniform algorithm as universal units of measurements of space and time from infinitesimal up to the Infinite!

The ideal scale of spatial and time measurements, undoubtedly, is based on the notion of a Uniform Field of Meaning and a Uniform Range of Measurement. Possible presence of this notion in the Vedas can be inferred from the Vedantic theory of unified field of energy, matter and meaning, Buddhist theory of interdependent quantum becoming and sāṅkhya's concept of numeric organization

¹⁴⁸ Swamikannu Pillai, *Indian Chronology (Solar, Lunar and Planetary)* B.C. 1 to A.D. 2000, New Delhi û Madras, 1989. P. (2).

of the cosmos.¹⁴⁹ Such physicists-theorists as E. Schrödinger and A. Einstein recognized the Vedantic origin of the unified field theory.

Lunar Hours

I started with belief that the movement of the Moon underlies the concept 'the Life of Brahmā.' Take into consideration that the Moon in one hour passes 0.51° . It follows that it will pass 1° in 117.64705 minutes. You may notice that gauging in hours gives fractional degrees and measurement in degrees results in fractional minutes. Both methods are not convenient for estimation of the Moon's movement. At the same time such system of measurement make the procedure bulky taking into account that the way of the Moon is precalculated every month (as against the Sun, which is displaced on 1° , two its angular diameters, only in 72 years.)

In ancient Indian system, as I see it now, some specific units of measurements for the path and time of the Moon were elaborated such as one hundredth of a second of a degree (nara-varṣa, 'human unit' – absolutely incorrectly interpreted as a 'human year,') one thousandth of a degree (deva-varṣa, 'celestial unit' – wrongly interpreted as a 'divine or god's year,') two hundredth of a second of time (truti) and lunar hour (muhūrta.) As 1° consists of 60', and 1' of 60", the quantity of seconds in 1° is equal to 3600, and the quantity of nara-varṣa is hundred times bigger, that is 360000 units.

Manu describes the amount of instants in a day, establishes the ratio between deva-varṣas and nara-varṣas and deduces the concept of the Life of Brahmā in the framework of the Lunar Astronomy.

It is evident (see the table 12) that hours are getting along with the movement of the Moon through the tenths of a degree as fractional units, whereas muhūrtas are harmonious divisions of time.

¹⁴⁹ Mahesh Yogi, Maharishi's Vedic Mathematics. In: Kapoor, S. K. Foundations of Higher Vedic Mathematics, New Delhi, 1998. Pp. 259–313.

Table 12.

Units of measurements of the Moon's course

Moon's Path			Moon's Time					
<i>De-grees, min., sec.</i>	<i>deva-varṣa 0.001^a</i>	<i>nara-varṣa 0.01"</i>	<i>truti 0.02 sec.</i>	<i>min.</i>	<i>muhūrtas</i>	<i>hours</i>	<i>days</i>	
4.32"			432					
0.8' or 48"			4800	1.6				
1.6' or 96"			9600	3.2				
3.2' or 192"			19200	6.4				
0.1°	100		36000	12	0.25	0.2		
0.2°	200		72000	24	0,5	0.4		
0.4°	400		144000	48	1	0.8		
0.8°	800		288000	96	2	1,6		
1.2°	1200		432000	144	3	2,4		
2.4°	2400		864000	288	6	4,8		
3.6°	3600		1296000	432	9	7,2		
4.8°	4800		1728000	576	12	9,6		
12°	12000		4320000	1440	30	24	1	
360°	360000		1296*105	43200	900	720	30	1
4320°			15552*105	518400	10800	8640	360	12
129600°			46656*106	15552000	324000	259200	10800	360
<i>First variant of the Life of Brahmā</i>				<i>309173760000000</i>		<i>198800 years of 360 days</i>		
<i>Second variant of the Life of Brahmā</i>				<i>311040000000000</i>		<i>200000 years of 360 days</i>		

Ancient Indians used also a division of the day into 24 hours (as it was noticed by A. Parpola, this is the amount of the basic nakṣatras with original names, the quantity of the half-months in a year.) Namely 24 hours can be divided into 8 (not 30 muhūrtas) and have relation to the division of the Ṛg-Veda into 'eighths' and day

into 8 watches (yāmas,) and also heavenly sphere into 8 ‘valleys’ of three ‘stages’ (RV I.35.8.) However, 30 muhūrtas match up the description of the movement of the Moon much better. It explains wider spread of the muhūrta-system in India preferring a lunar or solar-lunar calendar.

The quantity of trutis in a day of 30 muhūrtas is equal to:

$$144000 * 30 = 4320000 \text{ trutis.}$$

It means that the synodical Moon passes 1 nara-varṣa of its path (0.01") in one truti (0.02 sec.) Accordingly, 4320000 nara-varṣas will be passed in 4320000 trutis (1 full day,) 12000 deva-varṣas or 12° ($\frac{1}{30}$ of a synodical month.)

Trutis and nara-varṣas mach up ideally and represent universal units for the description of space and time in lunar astronomy.

The first Life of Brahmā, which is defined as 3091737600000000 nara-varṣas, consists of 198800 ceremonial years of 360 days (71568000 days.) It corresponds to one thousandth of the revolution of our galaxy and is ideal coordinating period for all known planetary periods.¹⁵⁰

The second model of the Life of Brahmā (3110400000000000 nara-varṣas) includes exactly 200000 ceremonial years of 360 days. These numbers are met across on Harappan seals as well.

Importance of the cyclic period of the Life of Brahmā for planetary coordination in lunar astronomy is obvious. What is not less wonderful, modern astrophysics gradually rejects notions of the Big Ban, the Beginning of Time and the Beginning of the universe, asserting a new vision of the universe infinite in space and time, which is constantly updated through intervals in some billions years, thus coming back to the ancient Indian theory of the Life of Brahmā.

¹⁵⁰ Kṣemendra. Opp.Cit. P. 291–292.

22. THE VEDAS AND MAHAYUGAS

The previous table reveals the following particularities: 48 minutes form 1 muhūrta, 144000 is the quantity of syllables of the Sāma-Veda, 288000 is the quantity of syllables of the Yajur-Veda as also the amount of seconds in which the Sun passes one of the 108 'steps,' into which the circle of ecliptic is divided,) 432000 is the quantity of syllables of the Ṛg-Veda and also the amount of nara-varṣas in the Kali-Yuga, 864000 is that in the Dvapara-Yuga as well as that of seconds in ten days, 1296000 is the amount of nara-varṣas in the Treta-Yuga as well as quantity of arc seconds in a circle, 1728000 is the amount of nara-varṣas in the Kṛta-Yuga, 4320000 is the amount of nara-varṣas in the Mahā-Yuga, and 129600000 is the amount of nara-varṣas in 100 Treta-Yugas.

If to equal an average syllable to a second of time (the Devī-Bhagavata contains a similar definition with only difference that it is duration of a mātrā, usually not an average, but a brief syllable) and to sum up the quantity of syllables in three Veda-Saṁhitās and the quantity of instants in four yugas the total will be 5184000 sec. (1440 hours or 60 days,) which correspond to the Sun's passage of 18 padas or two signs of the Zodiac (one of the six seasons.)

Table 13.

*Correspondence of syllables in the Saṁhitās
and instants in the yugas to seconds,
days and padas of the Sun*

		Syl- lables- sec.	hours	days	padas	zodical sign
Vedas	<i>Sāma</i>	144000	40	1.666	½	1/18
	<i>Yajur</i>	288000	80	3.333	1	1/9
	<i>Ṛg</i>	432000	120	5	1.5	1/6

Yugas	Kali	432000	120	5	1.5	$\frac{1}{6}$
	Dvapara	864000	240	10	3	$\frac{1}{3}$
	Treta	1296000	360	15	4.5	$\frac{1}{2}$
	Kṛta	1728000	480	20	6	$\frac{2}{3}$
	Total:	5184000	1440	60	18	2

A ceremonial year contains 86400 sec. * 360 day = 31104000 sec. (one ten-millionth of the Life of Brahmā.) The Sun passes one of the 108 padas of the Zodiac in 31104000 : 108 = 288000 sec. Therefore, 18 padas contain 288000 sec. * 18 = 5184000 sec., and bimonthly of the year will consist of 31104000 : 6 = 5184000 sec.

The quantity of syllables of the Sāma-Veda and the Yajur-Veda taken together, as well as the quantity of instants of the Kali-Yuga are equal to the quantity of syllables of the Ṛg-Veda. Therefore, the alternation of the Ṛg-Veda and two other Vedas allows getting any Yuga.

If syllable, as well as instant, is equal to 0.5 sec., the Sun will pass 9 padas or one sign of the Zodiac in one full period!

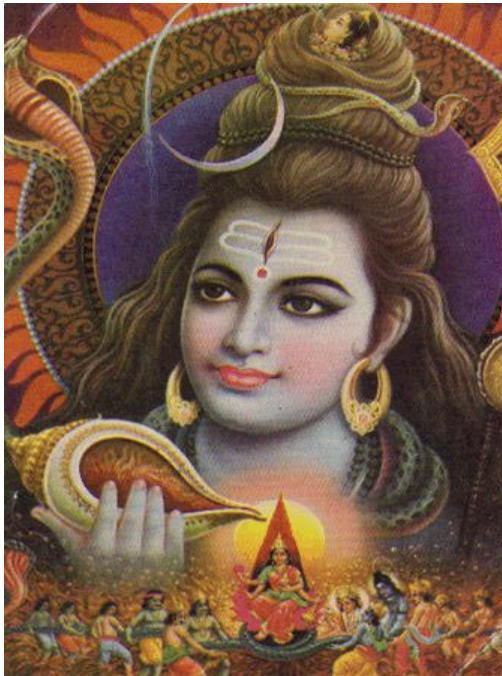
Table 14.

Quantities of syllables in the Saṁhitās and instants in the yugas in days and hours

		syllables/ trutis	hours	days
Vedas	Sāma	144000	24	1
	Yajur	288000	48	2
	Ṛg	432000	72	3
Yugas	Kali	432000	72	3
	Dvapara	864000	144	6
	Treta	1296000	216	9
	Kṛta	1728000	288	12
	Total	5184000	864	36

The Ṛg-Veda can be recited in a natural tempo of $1\frac{2}{3}$ syllables per second in three days and nights, the sum of syllables expressed by the three Vedas and four yugas in 36 (including the Atharva-Veda in

37.3 days.) Ten months of 36-37 days form five seasons of 73 days (as you remember, the quantity of verses in the basic text of s̄ankhya is exactly 73) within the framework of a ten-monthly year. Thus, indisputable connection of the phonetic organization and performance of the Vedas with daily and monthly chronometry comes to light.



23. DIFFERENTIAL CALCULUS OF TIME

F. I. Shcherbatsky noted in his article 'Scientific achievements of ancient India' that ancient Indians subsumed exponentiation and extraction of square and cube roots under the general heading of 'simple arithmetic operations.' Among higher operations, summation of arithmetic and geometrical progressions, irrational square root, solution of the definite and indefinite simple linear equations, and even solution of the indefinite second-degree (quadratic) equations were familiar to them. The latter discovery makes them direct predecessors of Joseph Louis Lagrange (1736 – 1813.)

Further, he paid attention to that all branches of the medieval Sanskrit science, such as atomic theory (in which the infra-atom forces comparable to mathematical points operate,) psychology, the theory of knowledge, metaphysics, astronomy and mathematics came from different sides to the concept of infinite, indefinite and limiting value and expressed it with the help of the concept of 'emptiness,' 'sky' or 'zero.' This concept is starting point of their higher mathematics. 'In this connection, he concludes, it is not surprising that the Indian astronomy was familiar with principles of differential calculus. <...> The method used by Indians in the XIIth century for definition of a longitude of planets, represents rather strong analogy if not identity with that formula which is used in modern mathematical astronomy.'¹⁵¹

F. I. Shcherbatsky also observes that there were special terms in Sanskrit astronomy for a designation of speed during vaguely short period of time, distinction between final time and infinitesimal, between average and exact speed of a planet. Astronomers used the special term for especially small time unit determined in 'Vaiśeṣika-Sūtra' as $\frac{1}{34000}$ sec. At the same time, they speak about units, which

¹⁵¹ Shcherbatsky F. I. Scientific achievements... Opp. Cit. P. 266–270.

can be indefinitely smaller. (See Table ‘Universal Time Scales.’)

F. I. Shcherbatsky pointed at that Bhāskara (XIth century) calculated the ‘instantaneous velocity’ of planets taking speed as a constant value and time as a variable. This ‘instantaneous velocity’ is differential of a planetary longitude, whence it follows, he concludes, that ‘both the concept of instantaneous velocity and the method of its definition were known to Bhāskara, and hence, he can be recognized as the predecessor of Sir Isaac Newton (1642 – 1727) in the domain of differential calculus.’

Bhāskara II

Bhāskara II was born in Vijapur in the province of Karnataka in 1114 C. E. His Siddhānta-Śīromaṇi (‘Doctrine’s Top Jewel’ 1150) embracing arithmetic (Līlāvati,) algebra (Bijagaṇita) and astronomy (Gaṇitādhyaya and Golādhyaya) is considered a classical text in mathematics and astronomy.

Bhāskara II defines two kinds of planetary velocities: average speed (sthūlā gati) and instantaneous velocity (sukṣmā or tatkālikī gati.) The process of finding instantaneous velocity involves the use of differential calculus.¹⁵²

Conclusion

The Vedic philosophy, no doubt, is cosmic and universal. The Vedic science is the real and the only foundation of all civilizations on the Earth. All other religious scriptures were created on the model of the Vedas. All sciences sprung out of them. We must reread carefully without prejudice the message of ancient astronomers-poets, which, if understood correctly, may be of greatest value in this cosmic cyber-era.

The Vedas, representing the most ancient stratum of spiritual-

¹⁵² D. M. Bose, S. N. Sen and B. V. Subbarayappa, A Concise... Opp. Cit. P. 203.

cultural heritage of mankind, has come to us in a digital encoding combining the beauty of poetry and exactness of mathematics. This book is an attempt to justify a prophetic vision of the Vedas as a recital-based ritualistic calendar-computer realized in concrete functioning of the Vedic śrauta ritual and yogic observation and recitation. The integrated theory of Vedic interpretation formulates the necessity to explore comprehensively the collection of sophisticated Vedic codes.

Our methods of reconstruction of the Vedic computer are closely adjusted to the Vedic scientific hermeneutical tradition preserved in the Vedic manuals.

The Vedas represent really an operational system written in binary code for a bio-computer functioning with the only aid of memory and strict recitation. Finally, this ultimate secret and innermost scientific meaning of the great sacred literature has been revealed with the aid of modern computer.

Many will hesitate to accept these epoch-making results and will be inclined to censure them as foolish and inconsistent with such and such tradition of explanation. But this theory is not a modernization; it is a hard MATHEMATICAL argument arrived at by strict reasoning and the logic of modern indological investigations. Moreover, I see clearly that our interpretation is the only proper model of scientific explanation of the all multiple facts and discoveries accumulated during our own and similar researches.

Though we have found clues to original scientific content of these texts, it does not exclude the task of a further research and reconstruction of the hidden mathematical and astronomical sub-structure of the Vedas.

The scientific content, which is to be discovered, as it was not once in the history of the European science, will lead contemporary science and philosophy to new boundaries, concepts and methods.

The second part of the book will comprise description of detected codes and ciphers essential for the theory of Integral Vedic