"A knowledge of the commonplace, at least, of Oriental literature, philosophy, and religion is as necessary to the general reader of the present day as an acquaintance with the Latin and Greek classics was a generation or so ago. Immense strides have been made within the present century in these branches of learning; Sanskrit has been brought within the range of accurate philology, and its invaluable ancient literature thoroughly investigated; the language and sacred books of the Zoroastrians have been laid bare; Egyptian, Assyrian, and other records of the remote past have been deciphered, and a group of scholars speak of still more recondite Accadian and Hittite monuments; but the results of all the scholarship that has been devoted to these subjects have been almost inaccessible to the public because they were contained for the most part in learned or expensive works, or scattered throughout the numbers of scientific periodicals. Messrs. Trübner & Co., in a spirit of enterprise which does them infinite credit, have determined to supply the constantly-increasing want, and to give in a popular, or, at least, a comprehensive form, all this mass of knowledge to the world."—Times.

Second Edition, post 8vo, pp. xxxii.—748, with Map, cloth, price 21s.

THE INDIAN EMPIRE:
ITS PEOPLE, HISTORY, AND PRODUCTS.

By the Hon. Sir W. W. Hunter, K.C.S.I., C.S.I., C.LE., LL.D.,
Member of the Viceroy's Legislative Council,
Director-General of Statistics to the Government of India.

Being a Revised Edition, brought up to date, and incorporating the general results of the Census of 1881.

"It forms a volume of more than 700 pages, and is a marvellous combination of literary condensation and research. It gives a complete account of the Indian Empire, its history, peoples, and products, and forms the worthy outcome of seventeen years of labour with exceptional opportunities for rendering that labour fruitful. Nothing could be more lucid than Sir William Hunter's expositions of the economic and political condition of India at the present time, or more interesting than his scholarly history of the India of the past."—The Times.
THE FOLLOWING WORKS HAVE ALREADY APPEARED:—

Third Edition, post 8vo, cloth, pp. xvi.—42s., price 15s.

ESSAYS ON THE SACRED LANGUAGE, WRITINGS,
AND RELIGION OF THE PARSI.

By MARTIN HAUG, Ph.D.,
LATE OF THE UNIVERSITIES OF TUBINGEN, GOTTINGEN, AND BONN; SUPERINTENDENT
OF SANSCRIT STUDIES, AND PROFESSOR OF SANSCRIT IN THE POONA COLLEGE.
EDITED AND ENLARGED BY DR. E. W. WEST.

TO WHICH IS ADDED A BIOGRAPHICAL MEMOIR OF THE LATE DR. HAUG
BY PROF. E. F. EVANS.

I. HISTORY OF THE RESEARCHES INTO THE SACRED WRITINGS AND RELIGION OF THE
PARSI, FROM THE EARLIEST TIMES DOWN TO THE PRESENT.

II. LANGUAGES OF THE PARSIS ORPAPUI, OR THE SCRIPTURE OF THE PARSI.

III. THE ZOAND-AYEPACT, OR THE SCRIPTURE OF THE PARSI.

IV. THE ZORASTRIAN RELIGION, AS TO ITS ORIGIN AND DEVELOPMENT.

"ESSAYS ON THE SACRED LANGUAGE, WRITINGS, AND RELIGION OF THE PARSI," BY THE
LATE DR. MARTIN HAUG, EDITED BY DR. E. W. WEST. THE AUTHOR INTENDED, ON HIS RETURN
FROM INDIA, TO EXPAND THE MATERIALS CONTAINED IN THIS WORK INTO A COMPREHENSIVE
ACCOUNT OF THE ZORASTRIAN RELIGION, BUT THE DESIGN WAS FRUSTRATED BY HIS UNTIMELY
DEATH. WE HAVE, HOWEVER, IN A CONCISE AND READABLE FORM, A HISTORY OF THE RESEARCHES
INTO THE SACRED WRITINGS AND RELIGION OF THE PARSI FROM THE EARLIEST TIMES DOWN TO
THE PRESENT—A DISCUSSION ON THE LANGUAGES OF THE PARSIS ORPAPUI, OR THE SCRIPTURE OF
THE PARSI, AND A DISCUSSION ON THE ZORASTRIAN RELIGION, WITH ESPECIAL REFERENCE TO ITS
ORIGIN AND DEVELOPMENT."—TIMES.

POST 8VO, CLOTH, PP. VIII.—175, PRICE 7S. 6D.

TEXTS FROM THE BUDDHIST CANON
COMMONLY KNOWN AS "DHAMMAPADA:"

WITH ACcompanying NARRATIVES.

TRANSLATED FROM THE CHINESE BY S. BEAL, B.A., PROFESSOR OF CHINESE,
UNIVERSITY COLLEGE, LONDON.

THE DHAMMAPADA, AS HITHERTO KNOWN BY THE PALL TEXT EDITION, AS EDITED
BY FAUSBOLL, BY MAX MÜLLER'S ENGLISH, AND ALBRECHT WEBER'S GERMAN
TRANSLATIONS, CONSISTS ONLY OF TWENTY-SIX CHAPITERS OR SECTIONS, Whilst
THE CHINESE VERSION, OR RATHER RECONSTRUCTION, AS NOW TRANSLATED BY MR. BEAL,
CONSISTS OF THIRTY-NINE SECTIONS. THE STUDENTS OF PALL WHO POSSESS FAUSBOLL'S
TEXT, OR EITHER OF THE ABOVE-NAMED TRANSLATIONS, WILL THEREFORE NEED WANT
MR. BEAL'S ENGLISH RENDERING OF THE CHINESE VERSION; THE THIRTEEN ABOVE-
NAMED ADDITIONAL SECTIONS NOT BEING ACCESSIBLE TO THEM IN ANY OTHER FORM;
FOR, EVEN IF THEY UNDERSTAND CHINESE, THE CHINESE ORIGINAL WOULD BE UN-
OBTAINABLE BY THEM.

"MR. BEAL'S RENDERING OF THE CHINESE TRANSLATION IS A MOST VALUABLE ADD TO THE
CRITICAL STUDY OF THE WORK. IT CONTAINS AUTHENTIC TEXTS GATHERED FROM ANCIENT
canonical books, and generally connected with some incident in the history of
Buddha. Their great interest, however, consists in the light which they throw upon
everyday life in India at the remote period at which they were written, and upon
the methods of teaching adopted by the founder of the religion. The method
employed was principally parable, and the simplicity of the tales and the excellence
of the morals inculcated, as well as the strange hold which they have retained upon
the minds of millions of people, make them a very remarkable study."—TIMES.

"MR. BEAL, BY MAKING IT ACCESSIBLE IN AN ENGLISH DRESS, HAS ADDED TO THE GREAT
SERVICES HE HAS ALREADY Rendered TO THE COMPARATIVE STUDY OF RELIGIOUS HISTORY."—ACADEMY.

"Valuable as exhibiting the doctrine of the Buddhist in its purest, least adul-
terated form, it brings the modern reader face to face with that simple creed and rule
of conduct which was tenet the minds of myriads, and which is now nominally
professed by 145 millions, who have overlaid its austerel simplicity with innumerable
ceremonies, forgotten its maxims, perverted its teaching, and so inverted its leading
principle that a religion whose founder denoted a God, now worships that founder as
a god himself."—SOUTHERAN.
Second Edition, post 8vo, cloth, pp. xxiv.—360, price 10s. 6d.

THE HISTORY OF INDIAN LITERATURE.

BY ALBRECHT WEBER.

Translated from the Second German Edition by JOHN MANN, M.A., and THÉODORE ZACHARIAE, Ph.D., with the sanction of the Author.

Dr. BEHLER, Inspector of Schools in India, writes:—"When I was Professor of Oriental Languages in Elphinstone College, I frequently felt the want of such a work to which I could refer the students."

Professor COWELL, of Cambridge, writes:—"It will be especially useful to the students in our Indian colleges and universities. I used to long for such a book when I was teaching in Calcutta. Hindu students are intensely interested in the history of Sanskrit literature, and this volume will supply them with all they want on the subject."

Professor V. KITNEY, Yale College, Newhaven, Conn., U.S.A., writes:—"I was one of the class to whom the work was originally given in the form of academic lectures. At their first appearance they were by far the most learned and able treatment of their subject; and with their recent additions they still maintain decidedly the same rank."

"Is perhaps the most comprehensive and lucid survey of Sanskrit literature extant. The essays contained in the volume were originally delivered as academic lectures, and at the time of their first publication were acknowledged to be by far the most learned and able treatment of the subject. They have now been brought up to date by the addition of all the most important results of recent research."—Times.

Post 8vo, cloth, pp. xii.—198, accompanied by Two Language Maps, price 7s. 6d.

A SKETCH OF THE MODERN LANGUAGES OF THE EAST INDIES.

BY ROBERT N. CUST.

The Author has attempted to fill up a vacuum, the inconvenience of which pressed itself on his notice. Much had been written about the languages of the East Indies, but the extent of our present knowledge had not even been brought to a focus. It occurred to him that it might be of use to others to publish in an arranged form the notes which he had collected for his own edification.

"Supplies a deficiency which has long been felt."—Times.

"The book before us is then a valuable contribution to philological science. It passes under review a vast number of languages, and it gives, or professes to give, in every case the sum and substance of the opinions and judgments of the best-informed writers."—Saturday Review.

Second Corrected Edition, post 8vo, pp. xii.—116, cloth, price 5s.

THE BIRTH OF THE WAR-GOD.

A Poem. By KALIDASA.

Translated from the Sanskrit into English Verse by RALPH T. H. GRIFFITH, M.A.

"A very spirited rendering of the Kundarāsmāthāra, which was first published twenty-six years ago, and which we are glad to see made once more accessible."—Times.

"Mr. Griffith's very spirited rendering is well known to most who are at all interested in Indian literature, or enjoy the tenderness of feeling and rich creative imagination of its author."—Indian Antiquary.

"We are very glad to welcome a second edition of Professor Griffith's admirable translation. Few translations deserve a second edition better."—Athenæum.
Post 8vo, pp. 432, cloth, price 16a.

A CLASSICAL DICTIONARY OF HINDU MYTHOLOGY
AND RELIGION, GEOGRAPHY, HISTORY, AND
LITERATURE.

By JOHN DOWSON, M.R.A.S.,
Late Professor of Hindustani, Staff College.

"This not only forms an indispensable book of reference to students of Indian literature, but is also of great general interest, as it gives in a concise and easily accessible form all that need be known about the personages of Hindu mythology whose names are so familiar, but of whom so little is known outside the limited circle of savants."—Times.

"It is no slight gain when such subjects are treated fairly and fully in a moderate space; and we need only add that the few wants which we may hope to see supplied in new editions detract but little from the general excellence of Mr. Dowson's work."—Saturday Review.

Post 8vo, with View of Mecca, pp. cxii.—172, cloth, price 9a.

SELECTIONS FROM THE KORAN.

By EDWARD WILLIAM LANE,
Translator of “The Thousand and One Nights;” &c., &c.

A New Edition, Revised and Enlarged, with an Introduction by
STANLEY LANE POOLE.

"... Has been long esteemed in this country as the compilation of one of the greatest Arab scholars of the time, the late Mr. Lane, the well-known translator of the 'Arabian Nights.' ... The present editor has enhanced the value of his relative's work by devoting the text of a great deal of extraneous matter introduced by way of comment, and prefixing an introduction."—Times.

"Mr. Poole is both a generous and a learned biographer. ... Mr. Poole tells us the facts ... so far as it is possible for industry and criticism to ascertain them, and for literary skill to present them in a condensed and readable form."—Englishman, Calcutta.

Post 8vo, pp. vi.—368, cloth, price 14a.

MODERN INDIA AND THE INDIANS,
BEING A SERIES OF IMPRESSIONS, NOTES, AND ESSAYS.

By MONIER WILLIAMS, D.C.L.,
Hon. LL.D. of the University of Calcutta, Hon. Member of the Bombay Asiatic Society, Boden Professor of Sanskrit in the University of Oxford.

Third Edition, revised and augmented by considerable Additions,
with Illustrations and a Map.

"In this volume we have the thoughtful impressions of a thoughtful man on some of the most important questions connected with our Indian Empire. ... An enlightened observer who, travelling among an enlightened observant people, Professor Monier Williams has brought before the public in a pleasant form more of the manners and customs of the Queen's Indian subjects than we ever remember to have seen in any one work. He not only deserves the thanks of every Englishman for this able contribution to the study of Modern India—a subject with which we should be specially familiar—but he deserves the thanks of every Indian, Parsee or Hindu, Buddhist and Mohammedan, for his clear exposition of their manners, their creeds, and their necessities."—Times.

Post 8vo, pp. xlv.—376, cloth, price 14a.

METRICAL TRANSLATIONS FROM SANSKRIT
WRITERS.

With an Introduction, many Prose Versions, and Parallel Passages from
Classical Authors.

By J. MUIR, C.I.E., D.C.L., LL.D., Ph.D.

"... An agreeable introduction to Hindu poetry."—Times.

"... A volume which may be taken as a fair illustration alike of the religious and moral sentiments and of the legendary lore of the best Sanskrit writers."—Edinburgh Daily Review.
SECOND EDITION, post 8vo, pp. xxvi. — 244, cloth, price 10s. 6d.

THE GULISTAN;

Or, Rose Garden of Sheik Mushliud-Din Sadi of Shiraz.

Translated for the First Time into Prose and Verse, with an Introductory Preface, and a Life of the Author, from the Atiah Kadah.

By EDWARD B. EASTWICK, C.B., M.A., F.R.S., M.R.A.S.

"It is a very fair rendering of the original."—Times.

"The new edition has long been desired, and will be welcomed by all who take any interest in Oriental poetry. The Gulistan is a typical Persian verse-book of the highest order. Mr. Eastwick's rhymed translation . . . has long established itself in a secure position as the best version of Sadi's finest work."—Academy.

"It is both faithfully and gracefully executed."—Tablet.

In Two Volumes, post 8vo, pp. viii. — 408 and viii. — 348, cloth, price 28s.

MISCELLANEOUS ESSAYS RELATING TO INDIAN SUBJECTS.

By BRIAN HOUGHTON HODGSON, Esq., F.R.S.,

Late of the Bengal Civil Service; Corresponding Member of the Institute; Chevalier of the Legion of Honour; late British Minister at the Court of Nepal, &c., &c.

CONTENTS OF VOL. I.

SECTION I.—On the Kocch, Bodd, and Dhimal Tribes.—Part I. Vocabulary.

Part II. Grammar.—Part III. Their Origin, Location, Numbers, Creed, Customs, Character, and Condition, with a General Description of the Climate they dwell in.

Appendix.

SECTION II.—On Himalayan Ethnology.—I. Comparative Vocabulary of the Languages of the Brokhen Tribes of Népal.—II. Vocabulary of the Dialects of the Kiranti Language.—III. Grammatical Analysis of the Vayu Language. The Vayu Grammar.

IV. Analysis of the Bishing Dialect of the Kiranti Language. The Bishing Grammar.—V. On the Vayu or Haya Tribe of the Central Himalaya.—VI. On the Kiranti Tribe of the Central Himalaya.

CONTENTS OF VOL. II.

SECTION III.—On the Aborigines of North-Eastern India. Comparative Vocabulary of the Tibetan, Bodd, and Garo Tongues.

SECTION IV.—Aborigines of the North-Eastern Frontier.

SECTION V.—Aborigines of the Eastern Frontier.

SECTION VI.—The Indo-Chinese Borderers, and their connection with the Himalaya and Tibetans. Comparative Vocabulary of Indo-Chinese Borderers in Arawak.

Comparative Vocabulary of Indo-Chinese Borderers in Tenasserim.

SECTION VII.—The Mongolian Affinities of the Caucasians.—Comparison and Analysis of Caucasian and Mongolian Words.

SECTION VIII.—Physical Type of Tibetans.

SECTION IX.—The Aborigines of Central India.—Comparative Vocabulary of the Aboriginal Languages of Central India.—Aborigines of the Eastern Gonds.—Vocabulary of some of the Dialects of the Hill and Wandering Tribes in the Northern Sircars.

—Aborigines of the Nilgiris, with Remarks on their Affinities.—Supplement to the Nilgrian Vocabulary.—The Aborigines of Southern India and Ceylon.

SECTION XI.—Route of Nepalese Mission to Pekin, with Remarks on the Watershed and Plateau of Tibet.

SECTION XII.—Route from Kâthmándú, the Capital of Nepal, to Darjeeling in Sikkim.—Memorandum relative to the Seven Coves of Nepal.

SECTION XIII.—Some Accounts of the Systems of Law and Police as recognised in the State of Nepal.

SECTION XIV.—The Native Method of making the Paper denominated Hindustan, Nepalese.

SECTION XV.—Pre-eminence of the Vernaculars; or, the Anglicists Answered; Being Letters on the Education of the People of India.

"For the study of the less-known races of India Mr. Brian Hodgson's 'Miscellaneous Essays' will be found very valuable both to the philologist and the ethnologist."
THE LIFE OR LEGEND OF GAUDAMA,
THE BUDDHA OF THE BURMESE. With Annotations.
The Ways to Nibban, and Notice on the Phonyles or Burmese Monks.

BY THE RIGHT REV. P. BIGANDET,
Bishop of Ramatha, Vicar-Apostolic of Ava and Pegu.

"The work is furnished with copious notes, which not only illustrate the subject-
matter, but form a perfect encyclopedia of Buddhist lore."—Times.
"A work which will furnish European students of Buddhism with a most valuable
help in the prosecution of their investigations."—Edinburgh Daily Review.
"Bishop Bigandet's invaluable work."—Indian Antiquary.
"Viewed in this light, its importance is sufficient to place students of the subject
under a deep obligation to its author."—Calcutta Review.
"This work is one of the greatest authorities upon Buddhism."—Dublin Review.

Post 8vo, pp. xxiv. — 420, cloth, price 18s.

CHINESE BUDDHISM.
A VOLUME OF SKETCHES, HISTORICAL AND CRITICAL.

BY J. EDKINS, D.D.

Author of "China's Place in Philology," "Religion in China," &c., &c.

"It contains a vast deal of important information on the subject, such as is only
to be gained by long-continued study on the spot."—Athenæum.
"Upon the whole, we know of no work comparable to it for the extent of its
original research, and the simplicity with which this complicated systems of philo-
sophy, religion, literature, and ritual is set forth."—British Quarterly Review.
"The whole volume is replete with learning. . . . It deserves most careful study
from all interested in the history of the religions of the world, and expressly of those
who are engaged in the propagation of Christianity. Dr. Edkins notices in terms of
just condemnation the exaggerated praise bestowed upon Buddhism by recent
English writers."—Record.

Post 8vo, pp. 496, cloth, price 10s. 6d.

LINGUISTIC AND ORIENTAL ESSAYS.
WRITTEN FROM THE YEAR 1846 TO 1878.

BY ROBERT NEEDHAM CUST,
Late Member of Her Majesty's Indian Civil Service; Hon. Secretary to
the Royal Asiatic Society;
and Author of "The Modern Languages of the East Indies."

"We know none who has described Indian life, especially the life of the natives,
with so much learning, sympathy, and literary talent."—Academy.
"They seem to us to be full of suggestive and original remarks."—St. James's Gazette.
"His book contains a vast amount of information. The result of thirty-five years
of inquiry, reflection, and speculation, and that on subjects as full of fascination as
of food for thought."—Tablet.
"Exhibit such a thorough acquaintance with the history and antiquities of India
as to entitle him to speak as one having authority."—Edinburgh Daily Review.
"The author speaks with the authority of personal experience. . . . It is this
constant association with the country and the people which gives such a vividness
to many of the pages."—Athenæum.
Post 8vo, pp. cixi, — 348, cloth, price 18s.

BUDDHIST BIRTH STORIES; or, Jataka Tales.
The Oldest Collection of Folk-lore Extant:
BEING THE JATAKATTHAVANNANA,
For the first time Edited in the original Pali.

By V. FAUSBOLL;
And Translated by T. W. RHYS DAVIDS.

Translation. Volume I.

"These are tales supposed to have been told by the Buddha of what he had seen and heard in his previous births. They are probably the nearest representatives of the original Aryan stories from which sprang the folk-lore of Europe as well as India. The introduction contains a most interesting dissertation on the migrations of these tales, tracing their reappearance in the various groups of folk-lore legends. Among other old friends, we meet with a version of the Judgment of Solomon."—Times.

"It is now some years since Mr. Rhys Davids asserted his right to be heard on this subject by his able article on Buddhism in the new edition of the 'Encyclopedia Britannica.'"—Leda Mercury.

"All who are interested in Buddhist literature ought to feel deeply indebted to Mr. Rhys Davids. His well-established reputation as a Pali scholar is a sufficient guarantee for the fidelity of his version, and the style of his translations is deserving of high praise."—Academy.

"No more competent expositor of Buddhism could be found than Mr. Rhys Davids. In the Jataka book we have, then, a priceless record of the earliest imaginative literature of our race; and... it presents to us a nearly complete picture of the social life and customs and popular beliefs of the common people of Aryan tribes, closely related to ourselves, just as they were passing through the first stages of civilization."—St. James's Gazette.

Post 8vo, pp. xxvii. — 362, cloth, price 14s.

A TALMUDIC MISCELLANY;
Or, A THOUSAND AND ONE EXTRACTS FROM THE TALMUD,
The Midrashim, and the Kabbalah.
Compiled and Translated by PAUL ISAAC HERSHON,
Author of "Genesis According to the Talmud," &c.

With Notes and Copious Indexes.

"To obtain in so concise and handy a form as this volume a general idea of the Talmud is a boon to Christians at least."—Times.

"Its peculiar and popular character will make it attractive to general readers. Mr. Hershon is a very competent scholar. ... Contains samples of the good, bad, and indifferent, and especially extracts that throw light upon the Scriptures."—British Quarterly Review.

"Will convey to English readers a more complete and truthful notion of the Talmud than any other work that has yet appeared."—Daily News.

"Without overlooking in the slightest the several attractions of the previous volumes of the 'Oriental Series,' we have no hesitation in saying that this surpasses them all in interest."—Edinburgh Daily Review.

"Mr. Hershon has... thus given English readers what is, we believe, a fair set of specimens which they can test for themselves."—The Record.

"This book is by far the best fitted in the present state of knowledge to enable the general reader to gain a fair and unbiased conception of the multitudinous contents of the wonderful miscellany which can only be truly understood—so Jewish pride asserts—by the life-long devotion of scholars of the Chosen People."—Inquirer.

"The value and importance of this volume consist in the fact that scarcely a single extract is given in its pages but throws some light, direct or refracted, upon those Scriptures which are the common heritage of Jew and Christian alike."—John Bull.

"It is a capital specimen of Hebrew scholarship; a monument of learned, loving, light-giving labour."—Jewish Herald.
THE CLASSICAL POETRY OF THE JAPANESE

By Basil Hall Chamberlain,
Author of "Yeigo Hadakuru Shirih." 

"A very curious volume. The author has manifestly devoted much labour to the task of studying the poetical literature of the Japanese, and rendering characteristic specimens into English verse." —Daily News.

"Mr. Chamberlain's volume is, so far as we are aware, the first attempt which has been made to interpret the literature of the Japanese to the Western world. It is to the classical poetry of Old Japan that we must turn for indigenous Japanese thought, and in the volume before us we have a selection from that poetry rendered into graceful English verse." —Tablet.

"It is undoubtedly one of the best translations of lyric literature which has appeared during the close of the last year." —Colonial Empire.

"Mr. Chamberlain set himself a difficult task when he undertook to reproduce Japanese poetry in an English form. But he has evidently laboured over anew, and his efforts are successful to a degree." —London and China Express.

THE HISTORY OF NEHARDON (Son of Sennacherib),
KING OF ASSYRIA, B.C. 681-669.

Translated from the Cuneiform Inscriptions upon Cylinders and Tablets in the British Museum Collection; together with a Grammatical Analysis of each Word, Explanations of the Ideographs by Extracts from the Bi-Lingual Syllogaries, and List of Eponyms, &c.

By Ernest A. Budge, B.A., M.R.A.S.,
Assyrian Exhibitioner, Christ's College, Cambridge.

"Students of scriptural archaeology will also appreciate the 'History of Harhadon.'" —Times.

"There is much to attract the scholar in this volume. It does not pretend to popularise studies which are yet in their infancy. Its primary object is to translate, but it does not assume to be more than tentative, and it offers both to the professional Assyriologist and to the ordinary non-Assyriological Semitic scholar the means of controlling its results." —Academy.

"Mr. Budge's book is, of course, mainly addressed to Assyrian scholars and students. They are not, it is to be feared, a very numerous class. But the more thanks are due to him on that account for the way in which he has acquitted himself in his laborious task." —Tablet.

THE MESNEVI
(Usually known as THE MESNEVITE SHIRIH, or HOLY MESNEVI)

OF MEVLANA (OUR LORD) JELALU 'D-DIN MUHAMMED ER-RUMI.

Book the First.

Together with some Account of the Life and Acts of the Author, of his Ancestors, and of his Descendants.

Illustrated by a Selection of Characteristic Anecdotes, as Collected by their Historian, MEVLANA SHIRINU 'D-DIN AHMED, EL EFLAKI, EL 'ARIFI.

Translated, and the Poetry Verified, in English,


"A complete treasury of occult Oriental lore." —Saturday Review.

"This book will be a very valuable help to the reader ignorant of Persia, who is desirous of obtaining an insight into a very important department of the literature extant in that language." —Tablet.
TRÜBNER'S ORIENTAL SERIES.

Post 8vo, pp. xvi. — 250, cloth, price 6s.

EASTERN PROVERBS AND EMBLEMS
ILLUSTRATING OLD TRUTHS.

BY REV. J. LONG,
Member of the Bengal Asiatic Society, F.R.G.S.

"We regard the book as valuable, and wish for it a wide circulation and attentive reading."—Record.
"Altogether, it is quite a feast of good things."—Globe.
"It is full of interesting matter."—Antiquary.

Post 8vo, pp. viii. — 270, cloth, price 7s. 6d.

INDIAN POETRY;

Containing a New Edition of the "Indian Song of Songs," from the Sanscrit of the "Gita Govinda" of Jayadeva; Two Books from "The Iliad of India" (Mahabharata), "Proverbal Wisdom" from the Shlokas of the Hitopadesha, and other Oriental Poems.

BY EDWIN ARNOLD, C.S.L., Author of "The Light of Asia."

"In this new volume of Messrs. Trübner's Oriental Series, Mr. Edwin Arnold does good service by illustrating, through the medium of his musical English melodies, the power of Indian poetry to stir European emotions. The 'Indian Song of Songs' is not unknown to scholars. Mr. Arnold will have introduced it among popular English poems. Nothing could be more graceful and delicate than the shades by which Krishna is portrayed in the gradual process of being weaned by the love of 'Beautiful Radha, jasmine-bosomed Radha,' from the allurements of the forest nymphs, in whom the five senses are typified."—Times.

"No other English poet has ever thrown his genius and his art so thoroughly into the work of translating Eastern ideas as Mr. Arnold has done in his splendid paraphrase of language contained in these mighty epics."—Daily Telegraph.

"The poem abounds with imagery of Eastern luxuriations and sensuousness; the air seems laden with the spicy odours of the tropics, and the verse has a richness and a melody sufficient to captivate the senses of the dulcet."—Standard.

"The translator, while producing a very enjoyable poem, has adhered with tolerable fidelity to the original text."—Overland Mail.

"We certainly wish Mr. Arnold success in his attempt to popularise Indian classics, that being, as his preface tells us, the goal towards which he bends his efforts."—Allen's Indian Mail.

Post 8vo, pp. xvi. — 396, cloth, price 10s. 6d.

THE MIND OF MENCIUS;

OR, POLITICAL ECONOMY FOUNDED UPON MORAL PHILOSOPHY.

A SYSTEMATIC DIGEST OF THE DOCTRINES OF THE CHINESE PHILOSOPHER MENCIUS.

Translated from the Original Text and Classified, with Comments and Explanations,

By the REV. ERNST FABER, Rhenish Mission Society.

Translated from the German, with Additional Notes,

By the REV. A. B. HUTCHINSON, C.M.S., Church Mission, Hong Kong.

"Mr. Faber is already well known in the field of Chinese studies by his digest of the doctrines of Confucius. The value of this work will be perceived when it is remembered that at no time since relations commenced between China and the West has the former been so powerful—we had almost said aggressive—as now. For those who will give it careful study, Mr. Faber's work is one of the most valuable of the excellent series to which it belongs."—Nature.
THE RELIGIONS OF INDIA.

BY A. BARTH.

Translated from the French with the authority and assistance of the Author.

"This volume is a reproduction, with corrections and additions, of an article contributed by the learned author two years ago to the 'Encyclopédie des Sciences Religieuses.' It attracted much notice when it first appeared, and is generally admitted to present the best summary extant of the vast subject with which it deals."—Tribet.

"This is not only on the whole the best but the only manual of the religions of India, apart from Buddhism, which we have in English. The present work... shows not only great knowledge of the facts and power of clear exposition, but also great insight into the inner history and the deeper meaning of the great religion, for it is in reality only one, which it proposes to describe."—Modern Review.

"The merit of the work has been emphatically recognized by the most authoritative Orientalists, both in this country and on the continent of Europe. But probably there are few Indians (if we may use the word) who would not derive a good deal of information from it, and especially from the extensive bibliography provided in the notes."—Dublin Review.

"Such a sketch M. Barth has drawn with a master-hand."—Critic (New York).

HINDU PHILOSOPHY.

THE SÁNKHYA KÁRIKA OF IS'WARA KRISHNA.

An Exposition of the System of Kapila, with an Appendix on the Nyáya and Vais'éshika Systems.

BY JOHN DAVIES, M.A. (Cantab.), M.R.A.S.

The system of Kapila contains nearly all that India has produced in the department of pure philosophy.

"The new Orientalist... finds in Mr. Davies a patient and learned guide who leads him into the intricacies of the philosophy of India, and supplies him with a clue, that he may not be lost in them. In the preface he states that the system of Kapila is the 'earliest attempt on record to give an answer, from reason alone, to the mysterious questions which arise in every thoughtful mind about the origin of the world, the nature and relations of man and his future destiny,' and in his learned and able notes he exhibits 'the connection of the Sankhya system with the philosophy of Spinoza,' and the connection of the system of Kapila with that of Schopenhauer and Von Hartmann."—Foreign Church Chronicle.

"Mr. Davies's volume on Hindu Philosophy is an undoubted gain to all students of the development of thought. The system of Kapila, which is here given in a translation from the Sankhya Kàrikà, is the only contribution of India to pure philosophy. It presents many points of deep interest to the student of comparative philosophy, and without Mr. Davies's lucid interpretation it would be difficult to appreciate these points in any adequate manner."—Saturday Review.

"We welcome Mr. Davies's book as a valuable addition to our philosophical library."—Notes and Queries.
A MANUAL OF HINDU PANTEISM. VEDÂNTASÂRA.
Translated, with copious Annotations,

BY MAJOR G. A. JACOB,
Bombay Staff Corps ; Inspector of Army Schools.

The design of this little work is to provide for missionaries, and for others who, like them, have little leisure for original research, an accurate summary of the doctrines of the Vedânta.

"The modest title of Major Jacob's work conveys but an inadequate idea of the vast amount of research embodied in his notes to the text of the Vedântasara. So copious, indeed, are these, and so much collateral matter do they bring to bear on the subject, that the diligent student will rise from their perusal with a fairly adequate view of Hindu philosophy generally. His work . . . is one of the best of its kind that we have seen."—Calcutta Review.

Post 8vo, pp. xii.—154, cloth, price 7s. 6d.

TSUMI—10 GOAM:
THE SUPREME BEING OF THE KHOI-KHOL.

BY THEOPHILUS HAHN, Ph.D.,
Custodian of the Grey Collection, Cape Town ; Corresponding Member of the Geogr. Society, Dresden ; Corresponding Member of the Anthropological Society, Vienna, &c., &c.

"The first instalment of Dr. Hahn's labours will be of interest, not alone to the Cape only, but in every University of Europe. It is, in fact, a most valuable contribution to the comparative study of religion and mythology. Accounts of their religion and mythological systems were scattered about in various books; these have been carefully collected by Dr. Hahn and printed in his second chapter, enriched and improved by what he has been able to collect himself."—Rev. Max Müller in the Nineteenth Century.

"It is full of good things."—St. James's Gazette.

In Four Volumes. Post 8vo, Vol. I., pp. xii.—352, cloth, price 12s. 6d., Vol. II., pp. vi.—408, cloth, price 12s. 6d., Vol. III., pp. viii.—414, cloth, price 12s. 6d., Vol. IV., pp. viii.—340, cloth, price 1os. 6d.

A COMPREHENSIVE COMMENTARY TO THE QURAN.
TO WHICH IS PREFIXED SÂLE'S PRELIMINARY DISCOURSE, WITH ADDITIONAL NOTES AND EMENDATIONS.
Together with a Complete Index to the Text, Preliminary Discourse, and Notes.

By Rev. E. M. WHEREY, M.A., Lodianna.

"As Mr. Wherry's book is intended for missionaries in India, it is no doubt well that they should be prepared to meet, if they can, the ordinary arguments and interpretations, and for this purpose Mr. Wherry's additions will prove useful."—Saturday Review.
Second Edition. Post 8vo, pp. vi. — 208, cloth, price 6s. 6d.

THE BHAGAVAD-GÎTÂ.
Translated, with Introduction and Notes.
By JOHN DAVIES, M.A. (Cantab.)

"Let us add that his translation of the Bhagavad Gîtâ is, as we judge, the best that has so far appeared in English, and that his Philological Notes are of quite peculiar value."—Dublin Review.

Post 8vo, pp. 96, cloth, price 5s.

THE QUATRAINS OF OMAR KHAYYAM.
Translated by E. H. WHINFIELD, M.A., Barrister-at-Law, late H.M. Bengal Civil Service.

Post 8vo, pp. xxxii. — 326, cloth, price 10s. 6d.

THE QUATRAINS OF OMAR KHAYYAM.
The Persian Text, with an English Verse Translation.
By E. H. WHINFIELD, late of the Bengal Civil Service.

"Mr. Whinfield has executed a difficult task with considerable success, and his version contains much that will be new to those who only know Mr. Fitzgerald's delightful selection."—American.

"The most prominent features in the Quatrain are their profound agnosticism, combined with a fatalism based more on philosophic than religious grounds, their Epicureanism and the spirit of universal tolerance and charity which animates them."—Calcutta Review.

Post 8vo, pp. xxiv. — 266, cloth, price 9s.

THE PHILOSOPHY OF THE UPAISHADS AND ANCELT INDIAN METAPHYSICS.
As exhibited in a series of Articles contributed to the Calcutta Review.
By ARCHIBALD EDWARD GOUGH, M.A., Lincoln College, Oxford; Principal of the Calcutta Madras.

"For practical purposes this is perhaps the most important of the works that have thus far appeared in 'Trübner's Oriental Series.' . . . We cannot doubt that for all who may take it up the work must be one of profound interest."—Saturday Review.

In Two Volumes. V-I. L, post 8vo, pp. xxiv. — 230, cloth, price 7s. 6d.

A COMPARATIVE HISTORY OF THE EGYPTIAN AND MESOPOTAMIAN RELIGIONS.
By Dr. C. F. TIELE.
Vol. I.—HISTORY OF THE EGYPTIAN RELIGION.
Translated from the Dutch with the Assistance of the Author.
By JAMES BALLINGAL.

"It places in the hands of the English readers a history of Egyptian Religion which is very complete, which is based on the best materials, and which has been illustrated by the latest results of research. In this volume there is a great deal of information, as well as independent investigation, for the truthworthiness of which Dr. Tiele's name is in itself a guarantee; and the description of the successive religions under the Old Kingdom, the Middle Kingdom, and the New Kingdom, is given in a manner which is scholarly and minute."—Scottian.
TRÜBNER’S ORIENTAL SERIES.

Post 8vo, pp. xii.—302, cloth, price 8a. 6d.

YUSUF AND ZULAIKHA.
A Poem by JAMI.
Translated from the Persian into English Verse.
By RALPH T. H. GRIFFITH.

"Mr. Griffith, who has done already good service as translator into verse from the Sanskrit, has done further good work in this translation from the Persian, and he has evidently shown not a little skill in his rendering the quaint and very oriental style of his author into our more prosaic, less figurative, language. . . . The work, besides its intrinsic merits, is of importance as being one of the most popular and famous poems of Persia, and that which is read in all the independent native schools of India where Persian is taught."—Scottish.

Post 8vo, pp. viii.—266, cloth, price 9s.

LINGUISTIC ESSAYS.
By CARL ABEL.

"An entirely novel method of dealing with philosophical questions and impart a real human interest to the otherwise dry technicalities of the science."—Standard.

"Dr. Abel is an opponent from whom it is pleasant to differ, for he writes with enthusiasm and temper, and his mastery over the English language fits him to be a champion of unpopular doctrines."—Athenaeum.

Post 8vo, pp. ix.—2821, cloth, price 10s. 6d.

THE SARVA-DARSANA-SAMGRAHA ;
Or, REVIEW OF THE DIFFERENT SYSTEMS OF HINDU PHILOSOPHY.
By MADHAVA ACHARYA.
Translated by E. B. COWELL, M.A., Professor of Sanskrit in the University of Cambridge, and A. E. GOUGH, M.A., Professor of Philosophy in the Presidency College, Calcutta.

This work is an interesting specimen of Hindu critical ability. The author successively passes in review the sixteen philosophical systems current in the fourteenth century in the South of India; and he gives what appears to him to be their most important tenets.

"The translation is trustworthy throughout. A protracted sojourn in India, where there is a living tradition, has familiarised the translator with Indian thought."—Athenaeum.

Post 8vo, pp. 1xv.—368, cloth, price 14s.

TIBETAN TALES DERIVED FROM INDIAN SOURCES.
Translated from the Tibetan of the KAH-GYUR.
By F. ANTON VON SCHIEFNER.
Done into English from the German, with an Introduction,
By W. E. S. RALSTON, M.A.

"Mr. Ralston, whose name is so familiar to all lovers of Russian folk-lore, has supplied some interesting Western analogies and parallels, drawn, for the most part, from Slavonic sources, to the Eastern folk-tales, culled from the Kahgyur, one of the divisions of the Tibetan sacred books."—Athenaeum.

"The translation . . . could scarcely have fallen into better hands. An Introduction . . . gives the leading facts in the lives of those scholars who have given their attention to gaining a knowledge of the Tibetan literature and language."—Calcutta Review.

"Ought to interest all who care for the East, for amusing stories, or for comparative folk-lore."—Pall Mall Gazette.
UDÂNAVARGA.
A COLLECTION OF VERSES FROM THE BUDDHIST CANON.
Compiled by DHÂMMAKRÂTA.

A BEING THE NORTHERN BUDDHIST VERSION OF DHÂMAPRÂDA.

Translated from the Tibetan of Ekal-hgyur, with Notes, and Extracts from the Commentary of Prajñavarman,

By W. WOODVILLE ROCKHILL.

"Mr. Rockhill's present work is the first from which assistance will be gained for a more accurate understanding of the Pali text; it is, in fact, as yet the only term of comparison available to us. The 'Udanaexperta,' the Tibetan version, was originally discovered by the late M. Schiefner, who published the Tibetan text, and had intended adding a translation, an intimation frustrated by his death, but which has been carried out by Mr. Rockhill. ... Mr. Rockhill may be congratulated for having well accomplished a difficult task."—Saturday Review.

In Two Volumes, post 8vo, pp. xxvi.—566, cloth, accompanied by a Language Map, price 18s.

A SKETCH OF THE MODERN LANGUAGES OF AFRICA.

By ROBERT NEEDHAM CUST,
Barrister-at-Law, and late of Her Majesty's Indian Civil Service.

"Any one at all interested in African languages cannot do better than get Mr. Cust's book. It is encyclopedic in its scope, and the reader gets a start clear away in any particular language, and is left free to add to the initial sum of knowledge there collected."—Natal Mercury.

"Mr. Cust has contrived to produce a work of value to linguistic students."—Nature.

Third Edition. Post 8vo, pp. xv.—250, cloth, price 7s. 6d.

OUTLINES OF THE HISTORY OF RELIGION TO THE SPREAD OF THE UNIVERSAL RELIGIONS.

By C. P. TIELE.
Doctor of Theology, Professor of the History of Religions in the University of Leyden.

Translated from the Dutch by J. ESTLIN CARPENTER, M.A.

"Few books of its size contain the result of so much wide thinking, able and laborious study, or enable the reader to gain a better bird's-eye view of the latest results of investigations into the religious history of nations. As Professor Tiele modestly says, 'In this little book are outlines—pencil sketches, I might say—nothing more.' But there are some men whose sketches from a thumb-nail are of far more worth than an enormous canvas covered with the crude painting of others, and it is easy to see that these pages, full of information, these sentences, cut and perhaps also dry, short and clear, condense the fruits of long and thorough research."—Scotsman.
A HISTORY OF BURMA.
Including Burma Proper, Pegu, Taungu, Tenasserim, and Arakan. From the Earliest Time to the End of the First War with British India.

"Sir Arthur Phayre's contribution to Trübner's Oriental Series supplies a recognized want, and its appearance has been looked forward to for many years. . . . General Phayre deserves great credit for the patience and industry which has resulted in this History of Burma."—Saturday Review.

Third Edition. Post 8vo, pp. 376, cloth, price 7s. 6d.

RELIGION IN CHINA.
By JOSEPH EDKINS, D.D., Peking.
Containing a Brief Account of the Three Religions of the Chinese, with Observations on the Prospects of Christian Conversion amongst that People.

"Dr. Edkins has been most careful in noting the varied and often complex phases of opinion, so as to give an account of considerable value of the subject."—Scotsman.
"As a missionary, it has been part of Dr. Edkins' duty to study the existing religions in China, and his long residence in the country has enabled him to acquire an intimate knowledge of them as they at present exist."—Saturday Review.
"Dr. Edkins' valuable work, of which this is a second and revised edition, has, from the time that it was published, been the standard authority upon the subject which it treats."—Nonconformist.
"Dr. Edkins . . . may now be fairly regarded as among the first authorities on Chinese religion and language."—British Quarterly Review.

Post 8vo, pp. x.—274, cloth, price 9s.

THE LIFE OF THE BUDDHA AND THE EARLY HISTORY OF HIS ORDER.
Derived from Tibetan Works in the Bkah-hgyur and Bstan-hgyur.
Followed by notices on the Early History of Tibet and Khoten.
Translated by W. W. ROCKHILL, Second Secretary U.S. Legation in China.

"The volume bears testimony to the diligence and fulness with which the author has consulted and tested the ancient documents bearing upon his remarkable subject."—Times.
"Will be appreciated by those who devote themselves to those Buddhist studies which have of late years taken in these Western regions so remarkable a development. Its matter possesses a special interest as being derived from ancient Tibetan works, some portions of which, here analysed and translated, have not yet attracted the attention of scholars. The volume is rich in ancient stories bearing upon the world's renovation and the origin of castes, as recorded in these venerable authorities."—Daily News.

Third Edition. Post 8vo, pp. viii.—454, cloth, price 16s.

THE SANKHYA APHORISMS OF KAPILA,
With Illustrative Extracts from the Commentaries.
Translated by J. R. BALLANTYNE, LL.D., late Principal of the Benares College.
Edited by FITZEDWARD HALL.

The work displays a vast expenditure of labour and scholarship, for which students of Hindu philosophy have every reason to be grateful to Dr. Hall and the publishers."—Calcutta Review.
TRÜBNER'S ORIENTAL SERIES.

In Two Volumes, post 8vo, pp. viii.-242, and viii.-370, cloth, price 24s. Dedicated by permission to H.H. the Prince of Wales.

BUDDHIST RECORDS OF THE WESTERN WORLD,
Translated from the Chinese of Huen Tsang (A.D. 629).

By SAMUEL BEAL, B.A.,
(Trin. Coll., Camb.); R.N. (Retired Chaplain and N.I.); Professor of Chinese, University College, London; Rector of Wark, Northumberland, &c.

An eminent Indian authority writes respecting this work:—"Nothing more can be done in elucidating the History of India until Mr. Beal's translation of the 'Shu-yu-k' appears."

"It is a strange fact of historical preservation that the best account of the condition of India at that ancient period has come down to us in the books of travel written by the Chinese pilgrims, of whom Huen Tsang is the best known."—Times.

Post 8vo, pp. xliii.-396, cloth, price 12s.

THE ORDINANCES OF MANU.
Translated from the Sanskrit, with an Introduction.

By the late A. C. BURNELL, Ph.D., C.I.E.
Completed and Edited by E. W. HOPKINS, Ph.D., of Columbia College, N.Y.

"This work is full of interest; while for the student of sociology and the science of religion it is full of importance. It is a great boon to get so notable a work in so accessible a form, admirably edited, and competently translated."—Scottus.

"Few men were more competent than Burnell to give us a really good translation of this well-known law book, first rendered into English by Sir William Jones. Burnell was not only an independent Sanskrit scholar, but an experienced lawyer, and he joined to these two important qualifications the rare faculty of being able to express his thoughts in clear and trenchant English. . . . We ought to feel very grateful to Dr. Hopkins for having given us all that could be published of the translation left by Burnell."—F. MAX MÜLLER in the Academy.

Post 8vo, pp. xii.-234, cloth, price 9s.

THE LIFE AND WORKS OF ALEXANDER
OSOMA DE KOROS,
Between 1819 and 1842. With a Short Notice of all his Published and Unpublished Works and Essays. From Original and for most part Unpublished Documents.

By THEODORE DUKA, M.D., F.R.C.S. (Eng.), Surgeon-Major
H.M.'s Bengal Medical Service, Retired, &c.

"Not too soon have Messrs. Trübner added to their valuable Oriental Series a history of the life and works of one of the most gifted and devoted of Oriental students, Alexander Osoma de Koros. It is forty-three years since his death, and though an account of his career was demanded soon after his decease, it has only now appeared in the important memoir of his compatriot, Dr. Duka."—Bookstaller.
In Two Volumes, post 8vo, pp. xii.-318 and vii.-312, cloth, price 31s.

MISCELLANEOUS PAPERS RELATING TO INDO-CHINA.


CONTENTS OF VOL. I.

I.—Some Accounts of Quedah. By Michael Topping.
II.—Report made to the Chief and Council of Balambangan, by Lieut. James Barton, of his several Surveys.
III.—Substance of a Letter to the Court of Directors from Mr. John Jesse, dated July 20, 1775, at Borneo Proper.
IV.—Formation of the Establishment of Poolo Poomang.
VII.—On the Traces of the Hindu Language and Literature extant amongst the Malays. By William Marsden.
IX.—A Botanical Description of Urcaola Elastics, or Caoutchouc Vine of Sumatra and Pulo-Pinang. By William Bozburgh, M.D.
X.—An Account of the Inhabitants of the Poggy, or Nassau Islands, lying off Sumatra. By John Crisp.
XI.—Remarks on the Species of Pepper which are found on Prince-Wales Island. By William Hunter, M.D.
XII.—On the Languages and Literature of the Indo-Chinese Nations. By J. Leidee, M.D.
XIII.—Some Account of an Orang-Outang of remarkable height found on the Island of Sumatra. By Clarke Abel, M.D.
XV.—Short Sketch of the Geology of Pulo-Pinang and the Neighbouring Islands. By T. Ware.
XVI.—Climate of Singapore.
XVII.—Inscription on the Jetty at Singapore.
XVIII.—Extract of a Letter from Colonel J. Low.
XIX.—Inscription at Singapore.
XX.—An Account of Several Inscriptions found in Province Wellesley. By Lieut.-Col. James Low.
XXII.—On an Inscription from Kediah. By Lieut.-Col. Low.
XXIII.—A Notice of the Alphabets of the Philippine Islands.
XXIV.—Succinct Review of the Observations of the Tides in the Indian Archipelago.
XXVII.—Paragraphs to be added to Capt. G. B. Tremenehere's Report.
XXIX.—Analysis of Iron Ores from Tavoy and Mergui, and of Limestones from Mergui. By Dr. A. Ure.
XXXI.—Report on a Route from the Mouth of the Pukchan to Krau, and thence across the Isthmus of Krau to the Gulf of Siam. By Capt. Al. Fraser and Capt. J. G. Fortong.
XXXIV.—Further Remarks. By E. Blyth.
MISCELLANEOUS PAPERS RELATING TO INDO-CHINA—continued.

CONTENTS OF VOL. II.

XXXV.—Catalogue of Mammalia inhabiting the Malayan Peninsula and Islands. By Theodore Cantor, M.D.


XXXVII.—Catalogue of Reptiles inhabiting the Malayan Peninsula and Islands. By Theodore Cantor, M.D.

XXXVIII.—Some Account of the Botanical Collection brought from the Eastward, in 1841, by Dr. Cantor. By the late W. Griffith.


XL.—Note, by Major-General G. B. Tromenbeere.

General Index.

Index of Vernacular Terms.

Index of Zoological Genera and Sub-Genera occurring in Vol. II.

"The papers treat of almost every aspect of Indo-China—its philology, economy, geography, geology—and constitute a very material and important contribution to our accessible information regarding that country and its people."—Contemporary Review.

Post 8vo, pp. xii.—72, cloth, price 5a.

THE SATAKAS OF BHARTRIHARI

Translated from the Sanskrit

By the Rev. B. HALE WORTHAM, M.R.A.S.,
Rector of Eggesford, North Devon.

"A very interesting addition to Trübner's Oriental Series."—Saturday Review.

"Many of the Maxims in the book have a Biblical ring and beauty of expression."—St. James' Gazette.

Post 8vo, pp. xii.—180, cloth, price 6a.

ANCIENT PROVERBS AND MAXIMS FROM BURMESE SOURCES;

Or, THE NITI LITERATURE OF BURMA.

By JAMES GRAY,


The Sanscrit-Pali word Niti is equivalent to "conduct" in its abstract, and "guide" in its concrete signification. As applied to books, it is a general term for a treatise which includes maxims, pithy sayings, and didactic stories, intended as a guide to such matters of every-day life as form the character of an individual and influence him in his relations to his fellow-men. Treatises of this kind have been popular in all ages, and have served as a most effective medium of instruction.

Post 8vo, pp. xxxii. and 330, cloth, price 7a. 6d.

MASHNAVI I MA'NAVI:

THE SPIRITUAL COUPLETS OF MAULANA JALALU-'D-DIN MUHAMMAD I KUMI.

Translated and Abridged by E. H. WHINFIELD, M.A.,
Late of H.M. Bengal Civil Service.
MAHAVA-DRAMA-CASTRA
THE CODE OF MAHAVINAYAKA

Oriental Sanskrit Text, with Critical Notes.
By J. THOMAS, Ph.D.
Professor of Sanskrit in the University of Wroclaw; late Professor of Law in the University of Calcutta.

The title assigned by Sir William Jones to this Code—the well-known Great Law Book of the Hindus—is wrong, as the rules and precepts contained in it had probably existed as traditions for centuries ages before. There has been no earlier edition of the Text for Students for many years past, and it is believed, therefore, that Prof. Jolly's work will supply a want long felt.

LEAVES FROM MY CHINESE SCRAP-BOOK.

By FREDERICK HENRY SELFOCK.
Author of "Watts and Strays from the Far East," "The Tea Table," 
"Idiomatological Phrases in the Peking Cockney," &c. &c.

LINGUISTIC AND ORIENTAL ESSAYS
Written from the Year 1857 to 1887. Second Series.
By ROBERT NEEDHAM CUST, LL.D.,
Barrister-at-Law; Honorary Secretary of the Royal Asiatic Society; Late Member of Her Majesty's Indian Civil Service.

In Two Volumes, post 8vo, pp. xvi.-350 and vii.-314, cloth, price 21s.

MISCELLANEOUS PAPERS RELATING TO INDO-CHINA.
Edited by R. ROST, Ph.D. &c. &c.,
Librarian to the India Office.

SECOND SERIES.

In Two Volumes, post 8vo, pp. xii.-512, price 15s.

FOlk-TALES OF KASHMIR.

By the REV. J. HINTON KNOWLES, F.B.G.S., M.R.A.S., &c.
(C.M.B.) Missionary to the Kashmiris.
TRÜBNER'S ORIENTAL SERIES.

In Two Volumes, post 8vo, pp. xiii.-336 and x.-352, cloth, price 21s.

MEDEIVAL RESEARCHES FROM EASTERN ASIATIC SOURCES.

FRAGMENTS TOWARDS THE KNOWLEDGE OF THE GEOGRAPHY AND HISTORY OF CENTRAL AND WESTERN ASIA FROM THE THIRTEENTH TO THE SEVENTEENTH CENTURY.

BY K. BRETSCHNEIDER, M.D.,
Formerly Physician of the Russian Legation at Pekin.

In Two Volumes, post 8vo.

ALBERUNI'S INDIA:
AN ACCOUNT OF ITS RELIGION, PHILOSOPHY, LITERATURE, GEOGRAPHY, CHRONOLOGY, ASTRONOMY, CUSTOMS, LAW, AND ASTROLOGY (ABOUT A.D. 1031).

TRANSLATED INTO ENGLISH.

With Notes and Indices by Prof. EDWARD SACHAU,
University of Berlin.

* * * The Arabic Original, with an Index of the Sanskrit Words, Edited by Professor SACHAU, is in the press.

Post 8vo.

THE LIFE OF HIUEN TSANG.

BY THE SHAMANS HWUI LI AND YEN-TSUNG.

With a Preface containing an account of the Works of I-Tsang.

BY SAMUEL BEAL, B.A.

(Trin. Coll., Camb.); Professor of Chinese, University College, London; Rector of Wark, Northumberland, &c.


When the Pilgrim Huien Tsang returned from his travels in India, he took up his abode in the Temple of "Great Benevolence;" this convent had been constructed by the Emperor in honour of the Empress, Wen-te-hau. After Huien Tsang's death, his disciple, Hwui Li, composed a work which gave an account of his illustrious Master's travels; this work when he completed he buried, and refused to discover its place of concealment. But previous to his death he revealed its whereabouts to Yen-tsung, by whom it was finally revised and published. This is "The Life of Huien Tsang." It is a valuable sequel to the Si-yu-ki, correcting and illustrating it in many particulars.

IN PREPARATION:—

Post 8vo.

A SKETCH OF THE MODERN LANGUAGES OF OCEANIA.

BY R. N. CUST, LL.D.

Author of "Modern Languages of the East," "Modern Languages of Africa," &c.

LONDON: TRÜBNER & CO., 57 AND 59 LUDGATE HILL.
TRÜBNER'S

ORIENTAL SERIES.
ALBERUNI'S INDIA.

AN ACCOUNT OF THE RELIGION, PHILOSOPHY, LITERATURE,
GEOGRAPHY, CHRONOLOGY, ASTRONOMY, CUSTOMS,
LAWS AND ASTROLOGY OF INDIA
ABOUT A.D. 1030.

An English Edition, with Notes and Indices.

BY

DR. EDWARD C. SACHAU,
Professor in the Royal University of Berlin, and Principal of the Seminary for
Oriental Languages; Member of the Royal Academy of Berlin, and
Corresponding Member of the Imperial Academy of Vienna;
Honorary Member of the Asiatic Society of Great Britain and Ireland, London,
and of the American Oriental Society, Cambridge, U.S.A.

IN TWO VOLUMES.
VOL. II.

LONDON:
TRÜBNER & CO, LUDGATE HILL
1888.
[All rights reserved.]
ALBÈRÛNÎ'S INDIA.

CHAPTER XLIX.

A SUMMARY DESCRIPTION OF THE ERAS.

The eras serve to fix certain moments of time which are mentioned in some historical or astronomical connection. The Hindus do not consider it wearisome to reckon with huge numbers, but rather enjoy it. Still, in practical use, they are compelled to replace them by smaller (more handy) ones.

Of their eras we mention—

1. The beginning of the existence of Brahman.
2. The beginning of the day of the present nycthemeron of Brahman, i.e. the beginning of the kalpa.
3. The beginning of the seventh manvantara, in which we are now.
4. The beginning of the twenty-eighth caturyuga, in which we are now.
5. The beginning of the fourth yuga of the present caturyuga, called kalikåla, i.e. the time of Kali. The whole yuga is called after him, though, accurately speaking, his time falls only in the last part of the yuga. Notwithstanding, the Hindus mean by kalikåla the beginning of the kaliyuga.
6. Pândava-kåla, i.e. the time of the life and the wars of Bhårata.

All these eras vie with each other in antiquity, the

VOL. II.
one going back to a still more remote beginning than
the other, and the sums of years which they afford go
beyond hundreds, thousands, and higher orders of num-
bers. Therefore not only astronomers, but also other
people, think it wearisome and unpractical to use them.

In order to give an idea of these eras, we shall use
as a first gauge or point of comparison that Hindu
year the great bulk of which coincides with the year
400 of Yazdajird. This number consists only of hun-
dreds, not of units and tens, and by this peculiarity
it is distinguished from all other years that might
possibly be chosen. Besides, it is a memorable time;
for the breaking of the strongest pillar of the religion,
the decease of the pattern of a prince, Mahmūd, the
lion of the world, the wonder of his time—may God
have mercy upon him!—took place only a short time,
less than a year, before it. The Hindu year precedes
the Naurōz or new year's day of this year only by
twelve days, and the death of the prince occurred pre-
cisely ten complete Persian months before it.

Now, presupposing this our gauge as known, we shall
compute the years for this point of junction, which is
the beginning of the corresponding Hindu year, for the
end of all years which come into question coincides
with it, and the Naurōz of the year 400 of Yazdajird
falls only a little latter (viz. twelve days).

The book *Vishnu-Dharma* says: "Vajra asked Mār-
kaṇḍeya how much of the life of Brahma had elapsed;
whereupon the sage answered: 'That which has elapsed
is 8 years, 5 months, 4 days, 6 manvantaras, 7 svāṃdi,
27 caturyugas, and 3 yugas of the twenty-eighth catur-
yuga, and 10 divya-years up to the time of the aśvamedha
which thou hast offered.' He who knows the details of
this statement and comprehends them duly is a sage
man, and the sage is he who serves the only Lord and
strives to reach the neighbourhood of his place, which is
called *Paramapada*."
Presupposing this statement to be known, and referring the reader to our explanation of the various measures of time which we have given in former chapters, we offer the following analysis.

Of the life of Brahma there have elapsed before our gauge 26,215,732,948,132 of our years. Of the nychthemeron of Brahma, i.e. of the kalpa of the day, there have elapsed 1,972,948,132, and of the seventh manvantara 120,532,132.

The latter is also the date of the imprisoning of the King Bali, for it happened in the first caturyuga of the seventh manvantara.

In all chronological dates which we have mentioned already and shall still mention, we only reckon with complete years, for the Hindus are in the habit of disregarding fractions of a year.

Further, the Vishnu-Dharma says: "Maraṇa-deva says, in answer to a question of Vajra, 'I have already lived as long as 6 kalpas and 6 manvantaras of the seventh kalpa, 23 tretāyugas of the seventh manvantara. In the twenty-fourth tretāyuga Rāma killed Rāvana, and Lakshmana, the brother of Rāma, killed Kumbha-karna, the brother of Rāvana. The two subjugated all the Rāksha-sas. At that time Vālmiki, the Rishi, composed the story of Rāma and Rāmâyana and eternalised it in his books. It was I who told it to Yudhishthira, the son of Pându, in the forest of Kāmyakavana.'"

The author of the Vishnu-Dharma reckons here with tretāyugas, first, because the events which he mentions occurred in a certain tretāyuga, and secondly, because it is more convenient to reckon with a simple unit than with such a unit as requires to be explained by reference to its single quarters. Besides, the latter part of the tretāyuga is a more suitable time for the events mentioned than its beginning, because it is so much nearer to the age of evil-doing (v. i. pp. 379, 380). No doubt, the date of Rāma and Rāmâyana is known among the
Hindus, but I for my part have not been able to ascertain it.

Twenty-three caturyugas are 99,360,000 years, and, together with the time from the beginning of a caturyuga till the end of the tretryuga, 102,384,000 years.

If we subtract this number of years from the number of years of the seventh manvantara that have elapsed before our gauge-year, viz. 120,532,132 (v. p. 3), we get the remainder of 18,148,132 years, i.e. so many years before our gauge-year as the conjectural date of Rama; and this may suffice, as long as it is not supported by a trustworthy tradition. The here-mentioned year corresponds to the 3,892,132d year of the 28th caturyuga.

All these computations rest on the measures adopted by Brahmagupta. He and Pulisa agree in this, that the number of kalpas which have elapsed of the life of Brahman before the present Kalpa is 6068 (equal to 8 years, 5 months, 4 days of Brahman). But they differ from each other in converting this number into caturyugas. According to Pulisa, it is equal to 6,116,544; according to Brahmagupta, only to 6,068,000 caturyugas. Therefore, if we adopt the system of Pulisa, reckoning 1 manvantara as 72 caturyugas without samdhi, 1 kalpa as 1008 caturyugas, and each yuga as the fourth part of a caturyuga, that which has elapsed of the life of Brahman before our gauge-year is the sum of 26,425,456,204,132 (!) years, and of the kalpa there have elapsed 1,986,124,132 years, of the manvantara 119,884,132 years, and of the caturyuga 3,244,132 years.

Regarding the time which has elapsed since the beginning of the kaliyuga, there exists no difference amounting to whole years. According to both Brahmagupta and Pulisa, of the kaliyuga there have elapsed before our gauge-year 4132 years, and between the
wars of Bhárata and our gauge-year there have elapsed 3479 years. The year 4132 before the gauge-year is the epoch of the kalikála, and the year 3479 before the gauge-year is the epoch of the Pánḍavakála.

The Hindus have an era called Kálayavana, regarding which I have not been able to obtain full information. They place its epoch in the end of the last dvaraparayuga. The here-mentioned Yavana (JMN) severely oppressed both their country and their religion.

To date by the here-mentioned eras requires in any case vast numbers, since their epochs go back to a most remote antiquity. For this reason people have given up using them, and have adopted instead the eras of—

1. Śrī Harsha.
2. Vikramáditya.
3. Śaka.
4. Valabha, and
5. Gupta.

The Hindus believe regarding Śrī Harsha that he used to examine the soil in order to see what of hidden treasures was in its interior, as far down as the seventh earth; that, in fact, he found such treasures; and that, in consequence, he could dispense with oppressing his subjects (by taxes, &c.) His era is used in Mathurá and the country of Kanoj. Between Śrī Harsha and Vikramáditya there is an interval of 400 years, as I have been told by some of the inhabitants of that region. However, in the Kashmirian calendar I have read that Śrī Harsha was 564 years later than Vikramáditya. In face of this discrepancy I am in perfect uncertainty, which to the present moment has not yet been cleared up by any trustworthy information.

Those who use the era of Vikramáditya live in the southern and western parts of India. It is used in the following way: 342 are multiplied by 3, which gives
the product 1026. To this number you add the years which have elapsed of the current shashtyabda or sexagesimal samvatsara, and the sum is the corresponding year of the era of Vikramâditya. In the book Srâdhava by Mahâdeva I find as his name Candrabâja.

As regards this method of calculation, we must first say that it is rather awkward and unnatural, for if they began with 1026 as the basis of the calculation, as they begin—without any apparent necessity—with 342, this would serve the same purpose. And, secondly, admitting that the method is correct as long as there is only one shashtyabda in the date, how are we to reckon if there is a number of shashtyabdás?

The epoch of the era of Śaka or Sakakâla falls 135 years later than that of Vikramâditya. The here-mentioned Śaka tyrannised over their country between the river Sindh and the ocean, after he had made Āryavarta in the midst of this realm his dwelling-place. He interdicted the Hindus from considering and representing themselves as anything but Śakas. Some maintain that he was a Śûdra from the city of Almansûra; others maintain that he was not a Hindu at all, and that he had come to India from the west. The Hindus had much to suffer from him, till at last they received help from the east, when Vikramâditya marched against him, put him to flight and killed him in the region of Karûr, between Multân and the castle of Lânî. Now this date became famous, as people rejoiced in the news of the death of the tyrant, and was used as the epoch of an era, especially by the astronomers. They honour the conqueror by adding Śrî to his name, so as to say Śrî Vikramâditya. Since there is a long interval between the era which is called the era of Vikramâditya (v. p. 5) and the killing of Śaka, we think that that Vikramâditya from whom the era has got its name is not identical with that one who killed Śaka, but only a namesake of his.
The era of Valabha is called so from Valabha, the ruler of the town Valabha, nearly 30 yojanas south of Anhilvâra. The epoch of this era falls 241 years later than the epoch of the Śaka era. People use it in this way. They first put down the year of the Śakakâla, and then subtract from it the cube of 6 and the square of 5 (216 + 25 = 241). The remainder is the year of the Valabha era. The history of Valabha is given in its proper place (cf. chap. xvii.)

As regards the Guptakâla, people say that the Guptas were wicked powerful people, and that when they ceased to exist this date was used as the epoch of an era. It seems that Valabha was the last of them, because the epoch of the era of the Guptas falls, like that of the Valabha era, 241 years later than the Śakakâla.

The era of the astronomers begins 587 years later than the Śakakâla. On this era is based the canon Khaṇḍakhaṇḍyaka by Brahmagupta, which among Muhammadans is known as Al-arkan.

Now, the year 400 of Yazdajird, which we have chosen as a gauge, corresponds to the following years of the Indian eras:

1. To the year 1488 of the era of Śrī Harsha,
2. To the year 1088 of the era of Vikramâditya,
3. To the year 953 of the Śakakâla,
4. To the year 712 of the Valabha era, which is identical with the Guptakâla,
5. To the year 366 of the era of the canon Khaṇḍakhaṇḍyaka,
6. To the year 526 of the era of the canon Paṅca-siddhântika by Varâhamihira,
7. To the year 132 of the era of the canon Karanâstra; and
8. To the year 65 of the era of the canon Karânapâlaka.
The eras of the here-mentioned canonæ are such as the authors of them considered the most suitable to be used as cardinal points in astronomical and other calculations, whence calculation may conveniently extend forward or backward. Perhaps the epochs of these eras fall within the time when the authors in question themselves lived, but it is also possible that they fall within a time anterior to their lifetime.

Common people in India date by the years of a centennium, which they call samvatsara. If a centennium is finished, they drop it, and simply begin to date by a new one. This era is called lokakśa, i.e. the era of the nation at large. But of this era people give such totally different accounts, that I have no means of making out the truth. In a similar manner they also differ among themselves regarding the beginning of the year. On the latter subject I shall communicate what I have heard myself, hoping meanwhile that one day we shall be able to discover a rule in this apparent confusion.

Those who use the Śaka era, the astronomers, begin the year with the month Caitra, whilst the inhabitants of Kanir, which is conterminous with Kashmir, begin it with the month Bhādrapada. The same people count our gauge-year (400 Yazdajird) as the eighty-fourth year of an era of theirs.

All the people who inhabit the country between Bardari and Mārgala begin the year with the month Kārttika, and they count the gauge-year as the 110th year of an era of theirs. The author of the Kashmirian calendar maintains that the latter year corresponds to the sixth year of a new centennium, and this, indeed, is the usage of the people of Kashmir.

The people living in the country Nīrāhara, behind Mārgala, as far as the utmost frontiers of Tākeshar and Lohāvar, begin the year with the month Mārgasīrha, and reckon our gauge-year as the 108th year of their
era. The people of Lanbaga, i.e. Lamghân, follow their example. I have been told by people of Multân that this system is peculiar to the people of Sindh and Kanoj, and that they used to begin the year with the new moon of Mârgaśîrsha, but that the people of Multân only a few years ago had given up this system, and had adopted the system of the people of Kashmir, and followed their example in beginning the year with the new moon of Caitra.

I have already before excused myself on account of the imperfection of the information given in this chapter. For we cannot offer a strictly scientific account of the eras to which it is devoted, simply because in them we have to reckon with periods of time far exceeding a centennium, (and because all tradition of events farther back than a hundred years is confused (v. p. 8).) So I have myself seen the roundabout way in which they compute the year of the destruction of Somanâth in the year of the Hijra 416, or 947 Šakakâla. First, they write down the number 242, then under it 606, then under this 99. The sum of these numbers is 947, or the year of the Šakakâla.

Now I am inclined to think that the 242 years have elapsed before the beginning of their centennial system, and that they have adopted the latter together with the Guptakâla; further, that the number 606 represents complete samvatsaras or centennials, each of which they must reckon as 101 years; lastly, that the 99 years represent that time which has elapsed of the current centennium.

That this, indeed, is the nature of the calculation is confirmed by a leaf of a canon composed by Durlabha of Multân, which I have found by chance. Here the author says: “First write 848 and add to it the laukika-kâla, i.e. the era of the people, and the sum is the Šakakâla.”

If we write first the year of the Šakakâla correspond-
ing to our gauge-year, viz. 953, and subtract 848 from it, the remainder, 105, is the year of the laukika-kāla, whilst the destruction of Somanāth falls in the ninety-eighth year of the centennium or laukika-kāla.

Durlabha says, besides, that the year begins with the month Mārgaśīrsha, but that the astronomers of Multān begin it with Caitra.

The Hindus had kings residing in Kābul, Turks who were said to be of Tibetan origin. The first of them, Barhatakān, came into the country and entered a cave in Kābul, which none could enter except by creeping on hands and knees. The cave had water, and besides he deposited there victuals for a certain number of days. It is still known in our time, and is called Var. People who consider the name of Barhatakān as a good omen enter the cave and bring out some of its water with great trouble.

Certain troops of peasants were working before the door of the cave. Tricks of this kind can only be carried out and become notorious, if their author has made a secret arrangement with somebody else—in fact, with confederates. Now these had induced persons to work there continually day and night in turns, so that the place was never empty of people.

Some days after he had entered the cave, he began to creep out of it in the presence of the people, who looked on him as a new-born baby. He wore Turkish dress, a short tunic open in front, a high hat, boots and arms. Now people honoured him as a being of miraculous origin, who had been destined to be king, and in fact he brought those countries under his sway and ruled them under the title of a shāhiya of Kābul. The rule remained among his descendants for generations, the number of which is said to be about sixty.

Unfortunately the Hindus do not pay much attention to the historical order of things, they are very careless
in relating the chronological succession of their kings, and when they are pressed for information and are at a loss, not knowing what to say, they invariably take to tale-telling. But for this, we should communicate to the reader the traditions which we have received from some people among them. I have been told that the pedigree of this royal family, written on silk, exists in the fortress Nagarkot, and I much desired to make myself acquainted with it, but the thing was impossible for various reasons.

One of this series of kings was Kanik, the same who is said to have built the vihara (Buddhistic monastery) of Purushâvar. It is called, after him, Kanik-caitya. People relate that the king of Kanoj had presented to him, among other gifts, a gorgeous and most singular piece of cloth. Now Kanik wanted to have dresses made out of it for himself, but his tailor had not the courage to make them, for he said, "There is (in the embroidery) the figure of a human foot, and whatever trouble I may take, the foot will always lie between the shoulders." And that means the same as we have already mentioned in the story of Bali, the son of Virocana (i.e. a sign of subjugation, cf. i. p. 397). Now Kanik felt convinced that the ruler of Kanoj had thereby intended to vilify and disgrace him, and in hot haste he set out with his troops marching against him.

When the rd$ heard this, he was greatly perplexed, for he had no power to resist Kanik. Therefore he consulted his Vazir, and the latter said, "You have roused a man who was quiet before, and have done unbecoming things. Now cut off my nose and lips, let me be mutilated, that I may find a cunning device; for there is no possibility of an open resistance." The rd$ did with him as he had proposed, and then he went off to the frontiers of the realm.
There he was found by the hostile army, was recognised and brought before Kanik, who asked what was the matter with him. The Vazir said, "I tried to dissuade him from opposing you, and sincerely advised him to be obedient to you. He, however, conceived a suspicion against me and ordered me to be mutilated. Since then he has gone, of his own accord, to a place which a man can only reach by a very long journey when he marches on the highroad, but which he may easily reach by undergoing the trouble of crossing an intervening desert, supposing that he can carry with himself water for so and so many days." Thereupon Kanik answered: "The latter is easily done." He ordered water to be carried along, and engaged the Vazir to show him the road. The Vazir marched before the king and led him into a boundless desert. After the number of days had elapsed and the road did not come to an end, the king asked the Vazir what was now to be done. Then the Vazir said, "No blame attaches to me that I tried to save my master and to destroy his enemy. The nearest road leading out of this desert is that on which you have come. Now do with me as you like, for none will leave this desert alive."

Then Kanik got on his horse and rode round a depression in the soil. In the centre of it he thrust his spear into the earth, and lo! water poured from it in sufficient quantity for the army to drink from and to draw from for the march back. Upon this the Vazir said, "I had not directed my cunning scheme against powerful angels, but against feeble men. As things stand thus, accept my intercession for the prince, my benefactor, and pardon him." Kanik answered, "I march back from this place. Thy wish is granted to thee. Thy master has already received what is due to him." Kanik returned out of the desert, and the Vazir went back to his master, the rdt of Kanoj. There he
found that on the same day when Kanik had thrust his spear into the earth, both the hands and feet had fallen off the body of the râk.

The last king of this race was Lagâtârmân, and his Vâzîr was Kallar, a Brahman. The latter had been fortunate, in so far as he had found by accident hidden treasures, which gave him much influence and power. In consequence, the last king of this Tibetan house, after it had held the royal power for so long a period, let it by degrees slip from his hands. Besides, Lagâtârmân had bad manners and a worse behaviour, on account of which people complained of him greatly to the Vâzîr. Now the Vâzîr put him in chains and imprisoned him for correction, but then he himself found ruling sweet, his riches enabled him to carry out his plans, and so he occupied the royal throne. After him ruled the Brahman kings Sâmand (Sâmanta), Kamalâ, Bhîm (Bhîma), Jaipâl (Jayapâla), Ánanda-pâla, Tarojanapâla (Trilocanapâla). The latter was killed A.H. 412 (A.D. 1021), and his son Bhîmapâla five years later (A.D. 1026).

This Hindu Shâhiya dynasty is now extinct, and of the whole house there is no longer the slightest remnant in existence. We must say that, in all their grandeur, they never slackened in the ardent desire of doing that which is good and right, that they were men of noble sentiment and noble bearing. I admire the following passage in a letter of Ánandapâla, which he wrote to the prince Maḥmûd, when the relations between them were already strained to the utmost: “I have learned that the Turks have rebelled against you and are spreading in Khurâsân. If you wish, I shall come to you with 5000 horsemen, 10,000 foot-soldiers, and 100 elephants, or, if you wish, I shall send you my son with double the number. In acting thus, I do not speculate on the impression which this will make on you. I have been conquered by you, and
therefore I do not wish that another man should conquer you."

The same prince cherished the bitterest hatred against the Muhammadans from the time when his son was made a prisoner, whilst his son Tarojanapāla (Trilocana-napāla) was the very opposite of his father.
CHAPTER I.

HOW MANY STAR-CYCLES THERE ARE BOTH IN A "KALPA"
AND IN A "CATORYUGA."

It is one of the conditions of a kalpa that in it the planets, with their apsides and nodes, must unite in o° of Aries, i.e. in the point of the vernal equinox. Therefore each planet makes within a kalpa a certain number of complete revolutions or cycles.

These star-cycles as known through the canon of Alfażârî and Ya'kJub Ibn Ṭârik, were derived from a Hindu who came to Bagdad as a member of the political mission which Sindh sent to the Khalif Almanṣâr, A.H. 154 (= A.D. 771). If we compare these secondary statements with the primary statements of the Hindus, we discover discrepancies, the cause of which is not known to me. Is their origin due to the translation of Alfażârî and Ya'kJub? or to the dictation of that Hindu? or to the fact that afterwards these computations have been corrected by Brahmagupta, or some one else? For, certainly, any scholar who becomes aware of mistakes in astronomical computations and takes an interest in the subject, will endeavour to correct them, as, e.g. Muḥammad Ibn Ishâk of Sarakhs has done. For he had discovered in the computation of Saturn a falling back behind real time (i.e., that Saturn, according to this computation, revolved slower than it did in reality). Now he assiduously studied the subject, till at last he was convinced that his fault did not originate
from the equation (i.e. from the correction of the places of the stars, the computation of their mean places). Then he added to the cycles of Saturn one cycle more, and compared his calculation with the actual motion of the planet, till at last he found the calculation of the cycles completely to agree with astronomical observation. In accordance with this correction he states the star-cycles in his canon.

Brahmagupta relates a different theory regarding the cycles of the apsides and nodes of the moon, on the authority of Aryabhaṭa. We quote this from Brahmagupta, for we could not read it in the original work of Aryabhaṭa, but only in a quotation in the work of Brahmagupta.

The following table contains all these traditions, which will facilitate the study of them, if God will.

<table>
<thead>
<tr>
<th>The planets</th>
<th>Number of their revolutions in a Kalpa</th>
<th>Number of the revolutions of their apsides</th>
<th>Number of the revolutions of their nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>4,320,000,000</td>
<td>480</td>
<td>Has no node.</td>
</tr>
<tr>
<td>Brahmagupta</td>
<td></td>
<td>488,105,858</td>
<td></td>
</tr>
<tr>
<td>The translation of Alfazārī</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aryabhaṭa</td>
<td></td>
<td>488,219,000</td>
<td></td>
</tr>
<tr>
<td>The anomalous revolution of the moon according to Brahmagupta</td>
<td>577,333,300,000</td>
<td>577,265,194,142</td>
<td>232,316,000</td>
</tr>
<tr>
<td>Moon</td>
<td></td>
<td>577,333,300,000</td>
<td>232,316,000 (The anomalous revolution of the moon is here treated as if it were the apsis, being the difference between the motion of the moon and that of the apsis. (See the notes.))</td>
</tr>
<tr>
<td>Mars</td>
<td>2,296,828,522</td>
<td>292</td>
<td>267</td>
</tr>
<tr>
<td>Mercury</td>
<td>17,936,998,084</td>
<td>332</td>
<td>521</td>
</tr>
<tr>
<td>Jupiter</td>
<td>354,226,455</td>
<td>855</td>
<td>63</td>
</tr>
<tr>
<td>Venus</td>
<td>7,022,389,492</td>
<td>653</td>
<td>893</td>
</tr>
<tr>
<td>Brahmagupta</td>
<td>146,567,308</td>
<td>41</td>
<td>584</td>
</tr>
<tr>
<td>The translation of Alfazārī</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturn</td>
<td>146,569,284</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The correction of Alfazārī</td>
<td>146,569,238</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The fixed stars</td>
<td>120,000 according to the translation of Alfazārī</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The computation of these cycles rests on the mean motion of the planets. As a caturyuga is, according to Brahmagupta, the one-thousandth part of a kalpa, we have only to divide these cycles by 10,000, and the quotient is the number of the star-cycles in one caturyuga.

Likewise, if we divide the cycles of the table by 10,000, the quotient is the number of the star-cycles in a kaliyuga, for this is one-tenth of a caturyuga. The fractions which may occur in those quotients are raised to wholes, to caturyugas or kaliyugas, by being multiplied by a number equal to the denominator of the fraction.

The following table represents the star-cycles specially in a caturyuga and kaliyuga, not those in a manvantara. Although the manvantaras are nothing but multiplications of whole caturyugas, still it is difficult to reckon with them on account of the samadhi which is attached both to the beginning and to the end of them.

<table>
<thead>
<tr>
<th>The names of the planets.</th>
<th>Their revolutions in a Caturyuga.</th>
<th>Their revolutions in a Kaliyuga.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>4,320,000</td>
<td>432,000</td>
</tr>
<tr>
<td>His apsis</td>
<td>0(\frac{1}{2})</td>
<td>0(\frac{1}{2})</td>
</tr>
<tr>
<td>Moon</td>
<td>57,753,300</td>
<td>5,775,330</td>
</tr>
<tr>
<td>Her apsis</td>
<td>488,105(\frac{1}{2})</td>
<td>48,810(\frac{1}{2})</td>
</tr>
<tr>
<td>Brahmagupta</td>
<td>488,219</td>
<td>48,821</td>
</tr>
<tr>
<td>Her anomalistic revolution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brahmagupta</td>
<td>57,265,194(\frac{1}{2})</td>
<td>5,726,519(\frac{1}{2})</td>
</tr>
<tr>
<td>Aryabhata</td>
<td>232,312(\frac{1}{2})</td>
<td>23,231(\frac{1}{2})</td>
</tr>
<tr>
<td>Her node</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The translation of Alfazart</td>
<td>232,316</td>
<td>23,231</td>
</tr>
<tr>
<td>Aryabhata</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mars</td>
<td>2,296,828(\frac{1}{2})</td>
<td>229,682(\frac{1}{2})</td>
</tr>
<tr>
<td>His apsis</td>
<td>0(\frac{1}{2})</td>
<td>0(\frac{1}{2})</td>
</tr>
<tr>
<td>His node</td>
<td>0(\frac{1}{2})</td>
<td>0(\frac{1}{2})</td>
</tr>
<tr>
<td>Mercury</td>
<td>17,936,998(\frac{1}{2})</td>
<td>1,793,099(\frac{1}{2})</td>
</tr>
<tr>
<td>His apsis</td>
<td>0(\frac{1}{2})</td>
<td>0(\frac{1}{2})</td>
</tr>
<tr>
<td>His node</td>
<td>0(\frac{1}{2})</td>
<td>0(\frac{1}{2})</td>
</tr>
<tr>
<td>Jupiter</td>
<td>364,226(\frac{1}{2})</td>
<td>36,422(\frac{1}{2})</td>
</tr>
<tr>
<td>His apsis</td>
<td>0(\frac{1}{2})</td>
<td>0(\frac{1}{2})</td>
</tr>
<tr>
<td>His node</td>
<td>0(\frac{1}{2})</td>
<td>0(\frac{1}{2})</td>
</tr>
</tbody>
</table>
The names of the planets. | Their revolutions in a Caturyuga. | Their revolutions in a Kaliyuga.
---|---|---
Venus | 7,022,389 || | 702,238 ||
Her apex | 01111 | 01111
Her node | 01111 | 01111
Saturn | 146,569 111 | 14,656 111
His apex | 01111 | 01111
His node | 01111 | 01111
{ The translation of } \text{ Alfazārī }
\text{ The correction of } \text{ Alsarakhṣī }
The fixed stars | 120 | 12

After we have stated how many of the star-cycles of a kalpa fall in a caturyuga and in a kaliyuga, according to Brahmagupta, we shall now derive from the number of star-cycles of a caturyuga according to Pulisa the number of star-cycles of a kalpa, first reckoning a kalpa = 1000 caturyugas, and, secondly, reckoning it as 1008 caturyugas. These numbers are contained in the following table:

The Yugas according to Pulisa.

| The names of the planets. | Number of their revolutions in a Caturyuga. | Number of their revolutions in a Kalpa of 1000 Caturyugas. | Number of their revolutions in a Kalpa of 1008 Caturyugas. |
---|---|---|---
Sun | 4,320,000 | 4,320,000,000 | 4,354,560,000
Moon | 57,753,336 | 57,753,336,000 | 58,215,362,688
Her apex | 488,219 | 488,219,000 | 492,124,752
Her node | 232,226 | 232,226,000 | 234,083,508
Mars | 2,296,824 | 2,296,824,000 | 2,315,198,592
Mercury | 17,937,000 | 17,937,000,000 | 18,080,496,000
Jupiter | 364,220 | 364,220,000 | 367,133,760
Venus | 7,022,388 | 7,022,388,000 | 7,078,567,104
Saturn | 146,569 | 146,569,000 | 147,736,512

We meet in this context with a curious circumstance. Evidently Alfazārī and Ya'qūb sometimes heard from their Hindu master expressions to this effect, that his calculation of the star-cycles was that of the great Siddhānta, whilst Āryabhaṭa reckoned with one-thousandth...
part of it. They apparently did not understand him properly, and imagined that āryabhata (Arab. erjabhar) meant a thousandth part. The Hindus pronounce the ȯ of this word something between a ȯ and an r. So the consonant became changed to an r, and people wrote erjabhar. Afterwards it was still more mutilated, the first r being changed to a z, and so people wrote azjabhar. If the word in this garb wanders back to the Hindus, they will not recognise it.

Further, Abū-alḥasan of Al'ahwāz mentions the revolutions of the planets in the years of al-arjabhar, i.e. in caturyugas. I shall represent them in the table such as I have found them, for I guess that they are directly derived from the dictation of that Hindu. Possibly, therefore, they give us the theory of Āryabhaṭa. Some of these numbers agree with the star-cycles in a caturyuga, which we have mentioned on the authority of Brahmagupta; others differ from them, and agree with the theory of Pulisa; and a third class of numbers differs from those of both Brahmagupta and Pulisa, as the examination of the whole table will show.

<table>
<thead>
<tr>
<th>The names of the planets</th>
<th>Their Yugas as parts of a Caturyuga according to Abū-alḥasan Al'ahwāz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>4,320,000</td>
</tr>
<tr>
<td>Moon</td>
<td>57,753,336</td>
</tr>
<tr>
<td>Her apsis</td>
<td>488,219</td>
</tr>
<tr>
<td>Her node</td>
<td>232,226</td>
</tr>
<tr>
<td>Mars</td>
<td>2,296,828</td>
</tr>
<tr>
<td>Mercury</td>
<td>17,937,020</td>
</tr>
<tr>
<td>Jupiter</td>
<td>304,324</td>
</tr>
<tr>
<td>Venus</td>
<td>7,022,388</td>
</tr>
<tr>
<td>Saturn</td>
<td>146,564</td>
</tr>
</tbody>
</table>
CHAPTER LI.


The months of the Hindus are lunar, their years solar; therefore their new year's day must in each solar year fall by so much earlier as the lunar year is shorter than the solar (roughly speaking, by eleven days). If this precession makes up one complete month, they act in the same way as the Jews, who make the year a leap year of thirteen months by reckoning the month Adar twice, and in a similar way to the heathen Arabs, who in a so-called annus procrastinationis postponed the new year's day, thereby extending the preceding year to the duration of thirteen months.

The Hindus call the year in which a month is repeated in the common language malamda. Mala means the dirt that clings to the hand. As such dirt is thrown away, thus the leap month is thrown away out of the calculation, and the number of the months of a year remains twelve. However, in the literature the leap month is called adhimāsa.

That month is repeated within which (it being considered as a solar month) two lunar months finish. If the end of the lunar month coincides with the beginning of the solar month, if, in fact, the former ends before any part of the latter has elapsed, this month is repeated, because the end of the lunar month, although
it has not yet run into the new solar month, still does no longer form part of the preceding month.

If a month is repeated, the first time it has its ordinary name, whilst the second time they add before the name the word dura to distinguish between them. If, e.g. the month Ashāḍha is repeated, the first is called Ashāḍha, the second Duraśāḍha. The first month is that which is disregarded in the calculation. The Hindus consider it as unlucky, and do not celebrate any of the festivals in it which they celebrate in the other months. The most unlucky time in this month is that day on which the lunaion reaches its end.

The author of the Vishnu-Dharma says: "Candra (mdna) is smaller than sāvana, i.e. the lunar year is smaller than the civil year, by six days, i.e. anarātra. Una means decrease, deficiency. Saura is greater than candra by eleven days, which gives in two years and seven months the supernumerary adhimāsa month. This whole month is unlucky, and nothing must be done in it."

This is a rough description of the matter. We shall now describe it accurately.

The lunar year has 360 lunar days, the solar year has \(361^{2}30\) lunar days. This difference sums up to the thirty days of an adhimāsa in the course of \(976^{2}17^{6}\) lunar days, i.e. in 32 months, or in 2 years, 8 months, 16 days, plus the fraction: \(17^{6}\) lunar day, which is nearly \(5\) minutes, \(15\) seconds.

As the religious reason of this theory of intercalation the Hindus mention a passage of the Veda, which they have read to us, to the following tenor: "If the day of conjunction, i.e. the first lunar day of the month, passes without the sun's marching from one zodiacal sign to the other, and if this takes place on the following day, the preceding month falls out of the calculation."

The meaning of this passage is not correct, and the criticism thereon.
translated the passage to me. For a month has thirty lunar days, and a twelfth part of the solar year has $30\frac{1}{12}$ lunar days. This fraction, reckoned in day-minutes, is equal to $55^1 19^\mathrm{m} 22^\mathrm{m} 30^\mathrm{w}$. If we now, for example, suppose a conjunction or new moon to take place at $0^\circ$ of a zodiacal sign, we add this fraction to the time of the conjunction, and thereby we find the times of the sun’s entering the signs successively. As now the difference between a lunar and a solar month is only a fraction of a day, the sun’s entering a new sign may naturally take place on any of the days of the month. It may even happen that the sun enters two consecutive signs on the same month-day (e.g. on the second or third of two consecutive months). This is the case if in one month the sun enters a sign before $4^h 40^m 37^w 30^w$ have elapsed of it; for the next following entering a sign falls later by $55^1 19^\mathrm{m} 23^\mathrm{m} 30^\mathrm{w}$, and both these fractions (i.e. less than $4^h 40^m 37^w 30^w$ plus the last-mentioned fraction) added together are not sufficient to make up one complete day. Therefore the quotation from the *Veda* is not correct.

I suppose, however, that it may have the following correct meaning:—If a month elapses in which the sun does not march from one sign to another, this month is disregarded in the calculation. For if the sun enters a sign on the 29th of a month, when at least $4^h 40^m 37^w 30^w$ have elapsed of it, this entering takes place before the beginning of the succeeding month, and therefore the latter month is without an entering of the sun into a new sign, because the next following entering falls on the first of the next but one or third month. If you compute the consecutive enterings, beginning with a conjunction taking place in $0^\circ$ of a certain sign, you find that in the thirty-third month the sun enters a new sign at $30^\circ 20^\mathrm{m}$ of the twenty-ninth day, and that he enters the next following sign at $25^1 39^\mathrm{m} 22^\mathrm{m} 30^\mathrm{w}$ of the first day of the thirty-fifth month.
Hence also becomes evident why this month, which is disregarded in the calculation, is considered as unlucky. The reason is that the month misses just that moment which is particularly adapted to earn in it a heavenly reward, viz. the moment of the sun's entering a new sign.

As regards adhimdsa, the word means the first month, for AD means beginning (i.e. ddi). In the books of Ya'kub Ibn Tariq and of Alfarabi this name is written padamda. Pada (in the orig. P-Dh) means end, and it is possible that the Hindus call the leap month by both names; but the reader must be aware that these two authors frequently misspell or disfigure the Indian words, and that there is no reliance on their tradition. I only mention this because Pulisa explains the latter of the two months, which are called by the same name, as the supernumerary one.

The month, as the time from one conjunction to the following, is one revolution of the moon, which revolves through the ecliptic, but in a course distant from that of the sun. This is the difference between the motions of the two heavenly luminaries, whilst the direction in which they move is the same. If we subtract the revolutions of the sun, i.e. the solar cycles of a kalpa, from its lunar cycles, the remainder shows how many more lunar months a kalpa has than solar months. All months or days which we reckon as parts of whole kalpas we call here universal, and all months or days which we reckon as parts of a part of a kalpa, e.g. of a caturyuga, we call partial, for the purpose of simplifying the terminology.

The year has twelve solar months, and likewise twelve lunar months. The lunar year is complete with twelve months, whilst the solar year, in consequence of the difference of the two year kinds, has, with the addition of the adhimdsa, thirteen months. Now evidently the difference between the universal solar and
lunar months is represented by these supernumerary months, by which a single year is extended to thirteen months. These, therefore, are the universal \textit{adhim\v{s}a} months.

The universal solar months of a \textit{kalpa} are 51,340,000,000; the universal lunar months of a \textit{kalpa} are 53,433,300,000. The difference between them or the \textit{adhim\v{s}a} months is 1,593,300,000.

Multiplying each of these numbers by 30, we get days, viz. solar days of a \textit{kalpa}, 1,555,200,000,000; lunar days, 1,602,999,000,000; the days of the \textit{adhim\v{s}a} months, 47,799,000,000.

In order to reduce these numbers to smaller ones we divide them by a common divisor, viz. 9,000,000. Thus we get as the sum of the days of the solar months 172,800; as the sum of the days of the lunar months, 178,111; and as the sum of the days of the \textit{adhim\v{s}a} months, 5311.

If we further divide the universal solar, civil, and lunar days of a \textit{kalpa}, each kind of them separately, by the universal \textit{adhim\v{s}a} months, the quotient represents the number of days within which a whole \textit{adhim\v{s}a} month sums up, viz. in 976\textsuperscript{444\frac{4}{11}} solar days, in 1006\textsuperscript{444\frac{4}{11}} lunar days, and in 990\textsuperscript{444\frac{4}{11}} civil days.

This whole computation rests on the measures which Brahmagupta adopts regarding a \textit{kalpa} and the star-cycles in a \textit{kalpa}.

According to the theory of Pulisa regarding the \textit{caturyuga}, a \textit{caturyuga} has 51,840,000 solar months, 53,433,336 lunar months, 1,593,336 \textit{adhim\v{s}a} months. Accordingly a \textit{caturyuga} has 1,555,200,000 solar days, 1,603,000,080 lunar days, 47,800,080 days of \textit{adhim\v{s}a} months.

If we reduce the numbers of the months by the common divisor of 24, we get 2,160,000 solar months, 2,226,389 lunar months, 66,389 \textit{adhim\v{s}a} months. If we divide the numbers of the day by the common
divisor of 720, we get 2,160,000 solar days, 2,226,389 lunar days, 66,389 days of the adhimāsa months. If we, lastly, divide the universal solar, lunar, and civil days of a caturyuga, each kind separately, by the universal adhimāsa months of a caturyuga, the quotient represents the numbers of days within which a whole adhimāsa month sums up, viz. in $976\frac{48}{6668}$ solar days, in $1006\frac{48}{6668}$ lunar days, and in $990\frac{48}{6668}$ civil days.

These are the elements of the computation of the adhimāsa, which we have worked out for the benefit of the following investigations.

Regarding the cause which necessitates the ānārdtra, lit. the days of the decrease, we have to consider the following.

If we have one year or a certain number of years, and reckon for each of them twelve months, we get the corresponding number of solar months, and by multiplying the latter by 30, the corresponding number of solar days. It is evident that the number of the lunar months or days of the same period is the same, plus an increase which forms one or several adhimāsa months. If we reduce this increase to adhimāsa months due to the period of time in question, according to the relation between the universal solar months and the universal adhimāsa months, and add this to the months or days of the years in question, the sum represents the partial lunar days, i.e. those which correspond to the given number of years.

This, however, is not what is wanted. What we want is the number of civil days of the given number of years which are less than the lunar days; for one civil day is greater than one lunar day. Therefore, in order to find that which is sought, we must subtract something from the number of lunar days, and this element which must be subtracted is called ānārdtra.

The ānārdtra of the partial lunar days stands in the same relation to the universal lunar days as the uni-
versal civil days are less than the universal lunar days. The universal lunar days of a kalpa are 1,602,999,000,000. This number is larger than the number of universal civil days by 25,082,550,000, which represents the universal ánardaṭra.

Both these numbers may be diminished by the common divisor of 450,000. Thus we get 3,562,220 universal lunar days, and 55,739 universal ánardaṭra days.

According to Pulisa, a caturyuga has 1,603,000,080 lunar days, and 25,082,280 ánardaṭra days. The common divisor by which both numbers may be reduced is 360. Thus we get 4,452,778 lunar days and 69,673 ánardaṭra days.

These are the rules for the computation of the ánardaṭra, which we shall hereafter want for the computation of the ahārgaṇa. The word means sum of days; for dh means day, and argaṇa, sum.

Ya’kūb Ibn Ṭāriḵ has made a mistake in the computation of the solar days; for he maintains that you get them by subtracting the solar cycles of a kalpa from the civil days of a kalpa, i.e. the universal civil days. But this is not the case. We get the solar days by multiplying the solar cycles of a kalpa by 12, in order to reduce them to months, and the product by 30, in order to reduce them to days, or by multiplying the number of cycles by 360.

In the computation of the lunar days he has first taken the right course, multiplying the lunar months of a kalpa by 30, but afterwards he again falls into a mistake in the computation of the days of the ánardaṭra. For he maintains that you get them by subtracting the solar days from the lunar days, whilst the correct thing is to subtract the civil days from the lunar days.
CHAPTER LII.

ON THE CALCULATION OF "AHARGANA" IN GENERAL,
THAT IS, THE RESOLUTION OF YEARS AND MONTHS
INTO DAYS, AND, VICE VERSĂ, THE COMPOSITION OF
YEARS AND MONTHS OUT OF DAYS.

The general method of resolution is as follows:—The
complete years are multiplied by 12; to the product are
added the months which have elapsed of the current
year, [and this sum is multiplied by 30;] to this product
are added the days which have elapsed of the current
month. The sum represents the saurdhargana, i.e. the
sum of the partial solar days.

You write down the number in two places. In the
one place you multiply it by 5311, i.e. the number
which represents the universal adhimasa months. The
product you divide by 172,800, i.e. the number which
represents the universal solar months. The quotient you
get, as far as it contains complete days, is added to the
number in the second place, and the sum represents the
candr̄dhargana, i.e. the sum of the partial lunar days.

The latter number is again written down in two
different places. In the one place you multiply it by
55,739, i.e. the number which represents the universal
ṣaṅgaṅdstra days, and divide the product by 3,562,220, i.e.
the number which represents the universal lunar days.
The quotient you get, as far as it represents complete
days, is subtracted from the number written in the
second place, and the remainder is the advandhargana,
i.e. the sum of civil days which we wanted to find.
However, the reader must know that this computation applies to dates in which there are only complete *adhisīsa* and *śanātra* days, without any fraction. If, therefore, a given number of years commences with the beginning of a *kalpa*, or a *caturyuga*, or a *kaliyuga*, this computation is correct. But if the given years begin with some other time, it may by chance happen that this computation is correct, but possibly, too, it may result in proving the existence of *adhisīsa* time, and in that case the computation would not be correct. Also the reverse of these two eventualities may take place. However, if it is known with what particular moment in the *kalpa*, *caturyuga*, or *kaliyuga* a given number of years commences, we use a special method of computation, which we shall hereafter illustrate by some examples.

We shall carry out this method for the beginning of the Indian year Śakakāla 953, the same year which we use as the gauge-year in all these computations.

First we compute the time from the beginning of the life of Brahman, according to the rules of Brahmagupta. We have already mentioned that 6068 *kalpas* have elapsed before the present one. Multiplying this by the well-known number of the days of a *kalpa* (1,577,916,450,000 civil days, *vide* i. p. 368), we get 9,574,797,018,600,000 as the sum of the days of 6068 *kalpas*.

Dividing this number by 7, we get 5 as a remainder, and reckoning five days backwards from the Saturday which is the last day of the preceding *kalpa*, we get Tuesday as the first day of the life of Brahman.

We have already mentioned the sum of the days of a *caturyuga* (1,577,916,450 days, *v. i. p. 370), and have explained that a *kritayuga* is equal to four-tenths of it, i.e. 631,166,580 days. A *manvantara* has seventy-one times as much, i.e. 112,032,067,950 days. The days of
six manvantaras and their samâdhis, consisting of seven krita yugas, are 676,610,573,760. If we divide this number by 7, we get a remainder of 2. Therefore the six manvantaras end with a Monday, and the seventh begins with a Tuesday.

Of the seventh manvantara there have already elapsed twenty-seven caturyugas, i.e. 42,603,744,150 days. If we divide this number by 7, we get a remainder of 2. Therefore the twenty-eighth caturyuga begins with a Thursday.

The days of the yugas which have elapsed of the present caturyuga are 1,420,124,805. The division by 7 gives the remainder 1. Therefore the kaliyuga begins with a Friday.

Now, returning to our gauge-year, we remark that the years which have elapsed of the kalpa up to that year are 1,972,948,132. Multiplying them by 12, we get as the number of their months 23,675,377,584. In the date which we have adopted as gauge-year there is no month, but only complete years; therefore we have nothing to add to this number.

By multiplying this number by 30 we get days, viz. 710,261,327,520. As there are no days in the normal date, we have no days to add to this number. If, therefore, we had multiplied the number of years by 360, we should have got the same result, viz. the partial solar days.

Multiply this number by 5311 and divide the product by 172,800. The quotient is the number of the adhimâsa days, viz. 21,829,849,018\(\frac{1}{16}\)\(\frac{2}{3}\). If, in multiplying and dividing, we had used the months, we should have found the adhimâsa months, and, multiplied by 30, they would be equal to the here-mentioned number of adhimâsa days.

If we further add the adhimâsa days to the partial solar days, we get the sum of 732,091,176,538, i.e. the partial lunar days. Multiplying them by 55,739, and
dividing the product by 3,562,220, we get the partial śnādırtra days, viz., 11,455,224,575.3118.

This sum of days without the fraction is subtracted from the partial lunar days, and the remainder, 720,635,951,963, represents the number of the civil days of our gregorian date.

Dividing it by 7, we get as remainder 4, which means that the last of these days is a Wednesday. Therefore the Indian year commences with a Thursday.

If we further want to find the adhimāsa time, we divide the adhimāsa days by 30, and the quotient is the number of the adhimāsa which have elapsed, viz. 727,661,633, plus a remainder of 28 days, 51 minutes, 30 seconds, for the current year. This is the time which has already elapsed of the adhimāsa month of the current year. To become a complete month, it only wants 1 day, 8 minutes, 30 seconds more.

We have here used the solar and lunar days, the adhimāsa and śnādırtra days, to find a certain past portion of a kalpa. We shall now do the same to find the past portion of a caturyuga, and we may use the same elements for the computation of a caturyuga which we have used for that of a kalpa, for both methods lead to the same result, as long as we adhere to one and the same theory (e.g. that of Brahmagupta), and do not mix up different chronological systems, and as long as each gunakāra and its bhāgabhāra, which we here mention together, correspond to each other in the two computations.

The former term means a multiplicator in all kinds of calculations. In our (Arabic) astronomical handbooks, as well as those of the Persians, the word occurs in the form gunādr. The second term means each divisor. It occurs in the astronomical handbooks in the form bahādr.

It would be useless if we were to exemplify this computation on a caturyuga according to the theory of Brah-
magupta, as according to him a caturyuga is simply one-
thousandth of a kalpa. We should only have to shorten
the above-mentioned numbers by three ciphers, and in
every other respect get the same results. Therefore we
shall now give this computation according to the theory
of Pulisa, which, though applying to the caturyuga, is
similar to the method of computation used for a kalpa.

According to Pulisa, in the moment of the beginning
of the gauge-year, there have elapsed of the years of the
caturyuga 3,244,132, which are equal to 1,167,887,520
solar days. If we multiply the number of months
which corresponds to this number of days with the
number of the adhimaśa months of a caturyuga or a
 corresponding multiplicator, and divide the product by
the number of the solar months of a caturyuga, or a
corresponding divisor, we get as the number of adхи-
maśa months 1,196,925,144.585.

Further, the past 3,244,132 years of the caturyuga
are 1,203,783,270 lunar days. Multiplying them by
the number of the ānāḍītra days of a caturyuga, and
dividing the product by the lunar days of a caturyuga, we
get as the number of ānāḍītra days 18,835,700.585.585.
Accordingly, the civil days which have elapsed since
the beginning of the caturyuga are 1,184,947,570, and
this it was which we wanted to find.

We shall here communicate a passage from the
Pulisa-siddhānta, describing a similar method of com-
putation, for the purpose of rendering the whole subject
clearer to the mind of the reader, and fixing it there
more thoroughly. Pulisa says: "We first mark the
kalpas which have elapsed of the life of Brahman
before the present kalpa, i.e. 6068. We multiply this
number by the number of the caturyugas of a kalpa,
i.e. 1008. Thus we get the product 6,116,544. This
number we multiply by the number of the yugas of a
caturyuga, i.e. 4, and get the product 24,466,176. This
number we multiply by the number of years of a yuga,
i.e. 1,080,000, and get the product 26,423,470,080,000.
These are the years which have elapsed before the present kalpa.

We further multiply the latter number by 12, so as to get months, viz. 317,081,640,960,000. We write down this number in two different places.

In the one place, we multiply it by the number of the adhimaśa months of a catuṛyuga, i.e. 1,593,336, or a corresponding number which has been mentioned in the preceding, and we divide the product by the number of the solar months of a catuṛyuga, i.e. 51,840,000.
The quotient is the number of adhimaśa months, viz. 9,745,709,750,784.

This number we add to the number written in the second place, and get the sum of 326,827,350,710,784. Multiplying this number by 30, we get the product 9,804,820,521,323,520, viz. lunar days.

This number is again written down in two different places. In the one place we multiply it by the śnāndītra of a catuṛyuga, i.e. the difference between civil and lunar days, and divide the product by the lunar days of a catuṛyuga. Thus we get as quotient 153,416,869,240,320, i.e. śnāndītra days.

We subtract this number from that one written in the second place, and we get as remainder 9,651,403,652,083,200, i.e. the days which have elapsed of the life of Brahman before the present kalpa, or the days of 6068 kalpas, each kalpa having 1,590,541,142,400 days. Dividing this sum of days by 7, we get no remainder. This period of time ends with a Saturday, and the present kalpa commences with a Sunday. This shows that the beginning of the life of Brahman too was a Sunday.

Of the current kalpa there have elapsed six manvantaras, each of 72 catuṛyugas, and each catuṛyuga of 4,320,000 years. Therefore six manvantaras have 1,866,240,000 years. This number we compute in the
same way as we have done in the preceding example. Thereby we find as the number of days of six complete manvantaras, 681,660,489,600. Dividing this number by 7, we get as remainder 6. Therefore the elapsed manvantaras end with a Friday, and the seventh manvantara begins with a Saturday.

Of the current manvantara there have elapsed 27 caturyugas, which, according to the preceding method of computation, represent the number of 42,603,780,600 days. The twenty-seventh caturyuga ends with a Monday, and the twenty-eighth begins with a Tuesday.

Of the current caturyuga there have elapsed three yugas, or 3,240,000 years. These represent, according to the preceding method of computation, the number of 1,183,438,350 days. Therefore these three yugas end with a Thursday, and kaliyuga commences with a Friday.

Accordingly, the sum of days which have elapsed of the kalpa is 725,447,708,550, and the sum of days which have elapsed between the beginning of the life of Brahma and the beginning of the present kaliyuga is 9,652,129,099,791,750.

To judge from the quotations from Āryabhaṭa, as we have not seen a book of his, he seems to reckon in the following manner:—

The sum of days of a caturyuga is 1,577,917,500. The time between the beginning of the kalpa and the beginning of the kaliyuga is 725,447,570,625 days. The time between the beginning of the kalpa and our gauge-date is 725,449,079,845. The number of days which have elapsed of the life of Brahma before the present kalpa is 9,651,401,817,120,000.

This is the correct method for the resolution of years into days, and all other measures of time are to be treated in accordance with this.

We have already pointed out (on p. 26) a mistake
of Ya’kūb Ibn Ṭārīk in the calculation of the universal solar and ānārdīra days. As he translated from the Indian language a calculation the reasons of which he did not understand, it would have been his duty to examine it, and to check the various numbers of it one by the other. He mentions in his book also the method of ṛārāgaṇa, i.e. the resolution of years, but his description is not correct; for he says:

"Multiply the months of the given number of years by the number of the adhimāsa months which have elapsed up to the time in question, according to the well-known rules of adhimāsa. Divide the product by the solar months. The quotient is the number of complete adhimāsa months plus its fractions which have elapsed up to the date in question."

The mistake is here so evident that even a copyist would notice it; how much more a mathematician who makes a computation according to this method; for he multiplies by the partial adhimāsa instead of the universal.

Besides, Ya’kūb mentions in his book another and perfectly correct method of resolution, which is this:

"When you have found the number of months of the years, multiply them by the number of the lunar months, and divide the product by the solar months. The quotient is the number of adhimāsa months together with the number of the months of the years in question.

"This number you multiply by 30, and you add to the product the days which have elapsed of the current month. The sum represents the lunar days.

"If, instead of this, the first number of months were multiplied by 30, and the past portion of the month were added to the product, the sum would represent the partial solar days; and if this number were further computed according to the preceding method, we should get the adhimāsa days together with the solar days."
The rationale of this calculation is the following:—If we multiply, as we have done, by the number of the universal adhimāsa months, and divide the product by the universal solar months, the quotient represents the portion of adhimāsa time by which we have multiplied. As, now, the lunar months are the sum of solar and adhimāsa months, we multiply by them (the lunar months) and the division remains the same. The quotient is the sum of that number which is multiplied and that one which is sought for, i.e. the lunar days.

We have already mentioned in the preceding part that by multiplying the lunar days by the universal ānārātra days, and by dividing the product by the universal lunar days, we get the portion of ānārātra days which belongs to the number of lunar days in question. However, the civil days in a kalpa are less than the lunar days by the amount of the ānārātra days. Now the lunar days we have stand in the same relation to the lunar days minus their due portion of ānārātra days as the whole number of lunar days (of a kalpa) to the whole number of lunar days (of a kalpa) minus the complete number of ānārātra days (of a kalpa); and the latter number are the universal civil days. If we, therefore, multiply the number of lunar days we have by the universal civil days, and divide the product by the universal lunar days, we get as quotient the number of civil days of the date in question, and that it was which we wanted to find. Instead of multiplying by the whole sum of civil days (of a kalpa), we multiply by 3,506,481, and instead of dividing by the whole number of lunar days (of a kalpa), we divide by 3,562,220.

The Hindus have still another method of calculation. It is the following:—"They multiply the elapsed years of the kalpa by 12, and add to the product the complete months which have elapsed of the current year. The sum they write down above the number 69,120,
and the number they get is subtracted from the number written down in the middle place. The double of the remainder they divide by 65. Then the quotient represents the partial adhimdsas months. This number they add to that one which is written down in the uppermost place. They multiply the sum by 30, and add to the product the days which have elapsed of the current month. The sum represents the partial solar days. This number is written down in two different places, one under the other. They multiply the lower number by 11, and write the product under it. Then they divide it by 403,963, and add the quotient to the middle number. They divide the sum by 703, and the quotient represents the partial anardra days. This number they subtract from the number written in the uppermost place, and the remainder is the number of civil days which we want to find."

The rationale of this computation is the following:—

If we divide the universal solar months by the universal adhimdsas months, we get as the measure of one adhimdsas month \(32\frac{8}{111}\) solar months. The double of this is \(65\frac{11}{111}\) solar months. If we divide by this number the double of the months of the given years, the quotient is the number of the partial adhimdasas. However, if we divide by wholes plus a fraction, and want to subtract from the number which is divided a certain portion, the remainder being divided by the wholes only, and the two subtracted portions being equal portions of the wholes to which they belong, the whole divisor stands in the same relation to its fraction as the divided number to the subtracted portion.

If we make this computation for our gauge-year, we get the fraction of \(\frac{11}{111}\), and dividing both numbers by 15, we get \(\frac{11}{11}\).

It would also be possible here to reckon by single adhimdasas instead of double ones, and in that case it
would not be necessary to double the remainder. But the inventor of this method seems to have preferred the reduplication in order to get smaller numbers; for if we reckon with single adhimaśas, we get the fraction of $\frac{4}{11}$, which may be reduced by 96 as a common divisor. Thereby we get 89 as the multiplicator, and 5400 as the divisor. In this the inventor of the method has shown his sagacity, for the reason for his computation is the intention of getting partial lunar days and smaller multipliers.

His method (i.e. Brahmagupta’s) for the computation of the anardtra days is the following:—

If we divide the universal lunar days by the universal anardtra days, we get as quotient 63 and a fraction, which may be reduced by the common divisor 450,000. Thus we get $63\frac{4}{5}\frac{1}{4}$ lunar days as the period of time within which one anardtra day sums up. If we change this fraction into eleventh parts, we get $\frac{9}{11}$ and a remainder of $\frac{4}{5}\frac{1}{4}$, which, if expressed in minutes, is equal to 0' 59" 54".

Since this fraction is very near to one whole, people have neglected it, and use, in a rough way, $\frac{9}{11}$ instead. Therefore, according to the Hindus, one anardtra day sums up in $63\frac{4}{5}$ or $\frac{9}{11}$ lunar days.

If we now multiply the number of anardtra days, which corresponds to the number of lunar days by $63\frac{4}{5}\frac{1}{4}$, the product is less than that which we get by multiplying by $63\frac{4}{11}$. If we, therefore, want to divide the lunar days by $\frac{9}{11}$, on the supposition that the quotient is equal to the first number, a certain portion must be added to the lunar days, and this portion he (the author of Pulisa-Siddhānta) had not computed accurately, but only approximatively. For if we multiply the universal anardtra days by 703, we get the product 17,633,032,650,000, which is more than eleven times the universal lunar days. And if we multiply the universal lunar days by 11, we get the product 17,632,989,000,000.
The difference between the two numbers is 43,650,000. If we divide by this number the product of eleven times the universal lunar days, we get as quotient 403,963.

This is the number used by the inventor of the method. If there were not a small remainder beyond the last-mentioned quotient (403,963 + a fraction), his method would be perfectly correct. However, there remains a fraction of \( \frac{404}{1368} \) or \( \frac{1}{37} \), and this is the amount which is neglected. If he uses this divisor without the fraction, and divides by it the product of eleven times the partial lunar days, the quotient would be by so much larger as the dividendum has increased. The other details of the calculation do not require comment.

Because the majority of the Hindus, in reckoning their years, require the adhimśa, they give the preference to this method, and are particularly painstaking in describing the methods for the computation of the adhimśa, disregarding the methods for the computation of the ānārātra days and the sum of the days (ahargāna). One of their methods of finding the adhimśa for the years of a kalpa or caturyuga or kaliyuga is this:

They write down the years in three different places. They multiply the upper number by 10, the middle by 2481, and the lower by 7739. Then they divide the middle and lower numbers by 9600, and the quotients are days for the middle number and avama for the lower number.

The sum of these two quotients is added to the number in the upper place. The sum represents the number of the complete adhimśa days which have elapsed, and the sum of that which remains in the other two places is the fraction of the current adhimśa. Dividing the days by 30, they get months.

Ya'kūb Ibn Tārīk states this method quite correctly. We shall, as an example, carry out this computation for our gauge-year. The years of the kalpa which have elapsed
till the moment of the gauge-date are 1,972,948,132. We write down this number in three different places. The upper number we multiply by ten, by which it gets a cipher more at the right side. The middle number we multiply by 2481 and get the product 4,894,884,315,492. The lower number we multiply by 7739, and get the product 15,268,645,593,548. The latter two numbers we divide by 9600; thereby we get for the middle number as quotient 509,883,782 and a remainder of 8292, and for the lower number a quotient of 1,590,483,915 and a remainder of 9548. The sum of these two remainders is 17,840. This fraction (i.e. $\frac{17,840}{9600}$) is reckoned as one whole. Thereby the sum of the numbers in all three places is raised to 21,829,849,018, i.e. adhimāsa days, plus $\frac{1}{10}$ day of the current adhimāsa day (i.e. which is now in course of summing up).

Reducing these days to months, we get 727,661,633 months and a remainder of twenty-eight days, which is called Sh-D-D. This is the interval between the beginning of the month Caitra, which is not omitted in the series of months, and the moment of the vernal equinox.

Further, adding the quotient which we have got for the middle number to the years of the kalpa, we get the sum of 2,482,831,914. Dividing this number by 7, we get the remainder 3. Therefore the sun has, in the year in question, entered Aries on a Tuesday.

The two numbers which are used as multiplicators for the numbers in the middle and lower places are to be explained in the following manner:—

Dividing the civil days of a kalpa by the solar cycles of a kalpa, we get as quotient the number of days which compose a year, i.e. $365\frac{1}{4}$. Reducing this fraction by the common divisor of 450,000, we get $365\frac{1}{4}$. The fraction may be further reduced by being divided by 3, but people leave it as it is, in order
that this fraction and the other fractions which occur
in the further course of this computation should have
the same denominator.

Dividing the universal ānarttra days by the solar
years of a kalpa, the quotient is the number of ānarttra
days which belong to a solar year, viz. $5\frac{41}{48}$,000
days. Reducing this fraction by the common divisor
of 450,000, we get $5\frac{17}{8}$,000 days. The fraction may fur-
ther be reduced by being divided by 3.

The measures of solar and lunar years are about 360
days, as are also the civil years of sun and moon, the
one being a little larger, the other a little shorter. The
one of these measures, the lunar year, is used in this
computation, whilst the other measure, the solar year,
is sought for. The sum of the two quotients (of the
middle and lower number) is the difference between the
two kinds of years. The upper number is multiplied by
the sum of the complete days, and the middle and lower
numbers are multiplied by each of the two fractions.

If we want to abbreviate the computation, and do not, like the Hindus, wish to find the mean motions of
sun and moon, we add the two multiplicators of the
middle and lower numbers together. This gives the
sum of 10,220.

To this sum we add, for the upper place, the product
of the divisor $\times 10 = 96,000$, and we get $\frac{106,220}{96,000}$. Reducing this fraction by the half, we get $\frac{21\frac{11}{15}}{48}$.

In this chapter (p. 27) we have already explained
that by multiplying the days by 5311, and dividing
the product by 172,800, we get the number of the
adhimāsas. If we now multiply the number of years
instead of the days, the product is $\frac{1}{10}$ of the product
which we should get when multiplying by the number
of days. If we, therefore, want to have the same quotient
which we get by the first division, we must divide by
$\frac{1}{10}$ of the divisor by which we divided in the first case,
viz. 480 (for $360 \times 480 = 172,800$).
Similar to this method is one prescribed by Pulisa: "Write down the number of the partial months in two different places. In the one place multiply it by 1111, and divide the product by 67,500. Subtract the quotient from the number in the other place, and divide the remainder by 32. The quotient is the number of the adhimāsa months, and the fraction in the quotient, if there is one, represents that part of an adhimāsa month which is in course of formation. Multiplying this amount by 30, and dividing the product by 32, the quotient represents the days and day-fractions of the current adhimāsa month."

The rationale of this method is the following:—

If you divide the solar months of a caturyuga by the adhimāsa months of a caturyuga, in accordance with the theory of Pulisa, you get as quotient $\frac{32^{8^{5.58}}}{6.33}$. If you divide the months by this number, you get the complete adhimāsa months of the past portion of the caturyuga or kalpa. Pulisa, however, wanted to divide by wholes alone, without any fractions. Therefore he had to subtract something from the dividend, as has already been explained in a similar case (p. 36). We have found, in applying the computation to our gauge-year, as the fraction of the divisor, $\frac{32^{8^{5.58}}}{6.33}$, which may be reduced by being divided by 32. Thereby we get $\frac{1111}{111}$. Pulisa has, in this calculation, reckoned by the solar days into which a date is resolved, instead of by months. For he says: "You write this number of days in two different places. In the one place you multiply it by 271 and divide the product by 4,050,000. The quotient you subtract from the number in the other place and divide the remainder by 976. The quotient is the number of adhimāsa months, days, and day-fractions."

Further he says: "The reason of this is, that by dividing the days of a caturyuga by the adhimāsa
months, you get as quotient 976 days and a remainder of 104,064. The common divisor for this number and for the divisor is 384. Reducing the fraction thereby, we get 1,101,427 days."

Here, however, I suspect either the copyist or the translator, for Pulissa was too good a scholar to commit similar blunders. The matter is this:

Those days which are divided by the adhimdasa months are of necessity solar days. The quotient contains wholes and fractions, as has been stated. Both denominator and numerator have as common divisor the number 24. Reducing the fraction thereby, we get 47,800,000.

If we apply this rule to the months, and reduce the number of adhimdasa months to fractions, we get 47,800,000 as denominator. A divisor common to both this denominator and its numerator is 16. Reducing the fraction thereby, we get 1,555,200.

If we now multiply the number which Pulissa adopts as divisor by the just-mentioned common divisor, i.e. 384, we get the product 1,555,200,000, viz. solar days in a caturyuga. But it is quite impossible that this number should, in this part of the calculation, be used as a divisor. If we want to base this method on the rules of Brahmagupta, dividing the universal solar months by the adhimdasa months, the result will be, according to the method employed by him, double the amount of the adhimdasa.

Further, a similar method may be used for the computation of the anardra days.

Write down the partial lunar days in two different places. In the one place, multiply the number by 50,663, and divide the product by 3,562,220. Subtract the quotient from the number in the other place, and divide the remainder by 63 without any fraction.

In the further very lengthy speculations of the
Hindus there is no use at all, especially as they require
the 
\textit{avama}, i.e. the remainder of the partial \textit{\textit{ánarötra}},
for the remainders which we get by the two divisions
have two different denominators.

He who is perfectly acquainted with the preceding
rules of resolution will also be able to carry out the
opposite function, the composition, if a certain amount
of past days of a \textit{kalpa} or \textit{caturyuga} be given. To
make sure, however, we shall now repeat the necessary
rules.

If we want to find the years, the days being given,
the latter must necessarily be \textit{civil} days, i.e. the differ-
ence between the lunar days and the \textit{ánarötra} days.
This difference (i.e. the \textit{civil} days) stands in the same
relation to their \textit{ánarötra} as the difference between the
universal lunar days and the universal \textit{ánarötra} days,
viz. 1,577,916,450,000, to the universal \textit{ánarötra} days.
The latter number (i.e. 1,577,916,450,000) is represented
by 3,506,481. If we multiply the given days by 55,739,
and divide the product by 3,506,481, the quotient rep-
resents the partial \textit{ánarötra} days. Adding hereto the civil
days, we get the number of lunar days, viz. the sum of
the partial solar and the partial \textit{adhimösa} days. These
lunar days stand in the same relation to the \textit{adhimösa}
days which belong to them as the sum of the uni-
versal solar and \textit{adhimösa} days, viz. 160,299,900,000,
to the universal \textit{adhimösa} days, which number (i.e.
160,299,900,000) is represented by the number 178,111.

If you, further, multiply the partial lunar days by
5311, and divide the product by 178,111, the quotient
is the number of the partial \textit{adhimösa} days. Subtract-
ing them from the lunar days, the remainder is the
number of solar days. Thereupon you reduce the days
to months by dividing them by 30, and the months to
years by dividing them by 12. This is what we want
to find.

\textit{E.g.} the partial \textit{civil} days which have elapsed up to
our gauge-year are 720,635,951,963. This number is given, and what we want to find is, how many Indian years and months are equal to this sum of days.

First, we multiply the number by 55,739, and divide the product by 3,506,481. The quotient is 11,455,224,875 śárdtbras days.

We add this number to the civil days. The sum is 732,091,176,538 lunar days. We multiply them by 5311, and divide the product by 178,111. The quotient is the number of adhímsëa days, viz. 21,829,849,018.

We subtract them from the lunar days and get the remainder of 710,261,327,520, i.e. partial solar days. We divide these by 30 and get the quotient of 23,675,377,584, i.e. solar months. Dividing them by 12, we get Indian years, viz. 1,972,948,132, the same number of years of which our gauge-date consists, as we have already mentioned in a previous passage.

Yākūb Ibn Tārik has a note to the same effect:

"Multiply the given civil days by the universal lunar days and divide the product by the universal civil days. Write down the quotient in two different places. In the one place multiply the number by the universal adhímsëa days and divide the product by the universal lunar days. The quotient gives the adhímsëa months. Multiply them by 30 and subtract the product from the number in the other place. The remainder is the number of partial solar days. You further reduce them to months and years."

The rationale of this calculation is the following:—

We have already mentioned that the given number of days are the difference between the lunar days and their śárdtbra, as the universal civil days are the difference between the universal lunar days and their universal śárdtbra. These two measures stand in a constant relation to each other. Therefore we get the partial lunar days which are marked in two different places. Now, these are equal to the sum of the solar
and adhīṃḍasa days, as the general lunar days are equal to the sum of universal solar days and universal adhīṃḍasa days. Therefore the partial and the universal adhīṃḍasa days stand in the same relation to each other as the two numbers written in two different places, there being no difference, whether they both mean months or days.

The following rule of Ya'kūb for the computation of the partial ṣunarāṭra days by means of the partial adhīṃḍasa months is found in all the manuscripts of his book:

"The past adhīṃḍasa, together with the fractions of the current adhīṃḍasa, are multiplied by the universal ṣunarāṭra days, and the product is divided by the universal solar months. The quotient is added to the adhīṃḍasa. The sum is the number of the past ṣunarāṭras."

This rule does not, as I think, show that its author knew the subject thoroughly, nor that he had much confidence either in analogy or experiment. For the adhīṃḍasa months which have passed of the catuṛyuga up to our gauge-date are, according to the theory of Pulisa, 1,196,525,111,873. Multiplying this number by the ṣunarāṭra of the catuṛyuga, we get the product 30,011,600,068,426,081. Dividing this number by the solar months, we get the quotient 578,927. Adding this to the adhīṃḍasa, we get the sum 1,775,452. And this is not what we wanted to find. On the contrary, the number of ṣunarāṭra days is 18,835,700. Nor is the product of the multiplication of this number by 30 that which we wanted to find. On the contrary, it is 53,263,560. Both numbers are far away from the truth.
CHAPTER LIII.

ON THE AHARGANĀ, OR THE RESOLUTION OF YEARS INTO MONTHS, ACCORDING TO SPECIAL RULES WHICH ARE ADOPTED IN THE CALENDARS FOR CERTAIN DATES OR MOMENTS OF TIME.

Not all the eras which in the calendars are resolved into days have epochs falling at such moments of time when just an adhimasa or ṣūnādra happens to be complete. Therefore the authors of the calendars require for the calculation of adhimasa and ṣūnādra certain numbers which either must be added or subtracted if the calculation is to proceed in good order. We shall communicate to the reader whatever of these rules we happened to learn by the study of their calendars or astronomical handbooks.

First, we mention the rule of the Khaṇḍakaḥādyaka, because this calendar is the best known of all, and preferred by the astronomers to all others.

Brahmagupta says: “Take the year of the Śakaḥāla, subtract therefrom 587, multiply the remainder by 12, and add to the product the complete months which have elapsed of the year in question. Multiply the sum by 30, and add to the product the days which have elapsed of the current month. The sum represents the partial solar days.

“Write down this number in three different places. Add 5 both to the middle and lower numbers, and divide the lowest one by 14,945. Subtract the quotient
from the middle number, and disregard the remainder which you have got by the division. Divide the middle number by 976. The quotient is the number of complete adhiniṣṇa months, and the remainder is that which has elapsed of the current adhiniṣṇa month.

"Multiply these months by 30, and add the product to the upper number. The sum is the number of the partial lunar days. Let them stand in the upper place, and write the same number in the middle place. Multiply it by 11, and add thereto 497. Write this sum in the lower place. Then divide the sum by 111,573. Subtract the quotient from the middle number, and disregard the remainder (which you get by the division). Further, divide the middle number by 703, and the quotient represents the ānurātra days, the remainder the avamās. Subtract the ānurātra days from the upper number. The remainder is the number of civil days."

This is the ṛḥargana of the Khaṇḍakhādyaka. Dividing the number by 7, the remainder indicates the weekday on which the date in question falls.

We exemplify this rule in the case of our gauge-year. The corresponding year of the Śakakāla is 953. We subtract therefrom 587, and get the remainder 366. We multiply it by the product of 12 × 30, since the date is without months and days. The product is 131,760, i.e. solar days.

We write down this number in three different places. We add 5 to the middle and lower numbers, whereby we get 131,765 in both places. We divide the lower number by 14,945. The quotient is 8, which we subtract from the middle number, and here we get the remainder 131,757. Then we disregard the remainder in which the division has resulted.

Further, we divide the middle number by 976. The quotient 134 represents the number of months. There is besides a remainder of 878. Multiplying the months by 30, we get the product 4020, which we add to the
solar days. Thereby we get lunar days, viz. 135,780. We write down this number below the three numbers, multiply it by 11, and add 497 to the product. Thus we get the sum 1,494,077. We write this number below the four numbers, and divide it by 111,573. The quotient is 13, and the remainder, i.e. 43,628, is disregarded. We subtract the quotient from the middle number. Thus we get the remainder, 1,494,064. We divide it by 703. The quotient is 2125, and the remainder, i.e. avama, is \( \frac{68}{703} \). We subtract the quotient from the lunar days, and get the remainder 133,655. These are the civil days which we want to find. Dividing them by 7, we get 4 as remainder. Therefore the 1st of the month Caitra of the gauge-year falls on a Wednesday.

The epoch of the era of Yazdajird precedes the epoch of this era (v. era nr. 5, p. 7) by 11,968 days. Therefore the sum of the days of the era of Yazdajird up to our gauge-date is 145,623 days. Dividing them by the Persian year and months, we get as the corresponding Persian date the year of Yazdajird 399, the 18th Isrindarmadh. Before the adhimāsā month becomes complete with 30 days, there must still elapse five ghatī, i.e. two hours. In consequence, the year is a leap year, and Caitra is the month which is reckoned twice in it.

The following is the method of the canon or calendar Al-arkand, according to a bad translation: “If you want to know the Arkand, i.e. ahargana, take 90, multiply it by 6, add to the product 8, and the years of the realm of Sindh, i.e. the time till the month Safar, a.h. 117, which corresponds to the Caitra of the year 109. Subtract therefrom 587, and the remainder represents the years of the Shakh.

An easier method is the following: “Take the complete years of the Aera Yazdagirdī, and subtract therefrom 33. The remainder represents the years of the Shakh. Or you may also begin with the original ninety
years of the Arkand. Multiply them by 6, and add 14 to the product. Add to the sum the years of the Aera Yazdajirdi, and subtract therefrom 587. The remainder represents the years of the Shakh.”

I believe that the here-mentioned Shakh is identical with Śaka. However, the result of this calculation does not lead us to the Śaka era, but to the Gupta era, which here is resolved into days. If the author of the Arkand began with 90, multiplied them by 6, added thereto 8, which would give 548, and did not change this number by an increase of years, the matter would come to the same result, and would be more easy and simple.

The first of the month Ṣafar, which the author of the latter method mentions, coincides with the eighth Daimāh of the year 103 of Yazdajird. Therefore he makes the month Caitra depend upon the new moon of Daimāh. However, the Persian months have since that time been in advance of real time, because the day-quarters (after the 365 complete days) have no longer been intercalated. According to the author, the era of the realm of Sindh which he mentions must precede the era of Yazdajird by six years. Accordingly, the years of this era for our gauge-year would be 405. These together with the years of the Arkand, with which the author begins, viz. 548, represent the sum of 953 years as the year of the Śakakāla. By the subtraction of that amount which the author has mentioned, it is changed into the corresponding year of the Gupta-kāla.

The other details of this method of resolution or ahargana are identical with those of the method of the Khandakhaḍyaka, as we have described it. Sometimes you find in a manuscript such a reading as prescribes the division by 1000 instead of by 976, but this is simply a mistake of the manuscripts, as such a method is without any foundation.

Next follows the method of Vijayanandin in his

VOL. II.
canon called Karanatilaka: “Take the years of the Sakakāla, subtract therefrom 888, multiply the remainder by 12, and add to the product the complete months of the current year which have elapsed. Write down the sum in two different places. Multiply the one number by 900, add 661 to the product, and divide the sum by 29,282. The quotient represents adhimasa months. Add it to the number in the second place, multiply the sum by 30, and add to the product the days which have elapsed of the current month. The sum represents the lunar days. Write down this number in two different places. Multiply the one number by 3300, add to the product 64,106, divide the sum by 210,902. The quotient represents the anardtra days, and the remainder the avamas. Subtract the anardtra days from the lunar days. The remainder is the aharagna, being reckoned from midnight as the beginning.”

We exemplify this method in the use of our gauge-year. We subtract from the corresponding year of the Sakakāla (953) 888, and there remains 65. This number of years is equal to 780 months. We write down this number in two different places. In the one place we multiply it by 900, add thereto 661, and divide the product by 29,282. The quotient gives \(\frac{23}{3}\) adhimasa months.

The multiplicator is 30. By being multiplied by it, the months are changed into days. The product, however, is again multiplied by 30. The divisor is the product of the multiplication of 976 plus the following fraction by 30, the effect of which is that both numbers belong to the same kind (i.e. that both represent days). Further, we add the resulting number of months to those months which we have previously found. By multiplying the sum by 30, we get the product of 24,060 (read 24,090), i.e. lunar days.

We write them down in two different places. The one number we multiply by 3300 and get the product
79,398,000 (read 79,497,000). Adding thereto 64,106 (read 69,601), we get the sum 79,462,104 (read 79,566,601). By dividing it by 210,902, we get the quotient 376 (read 307), i.e. ānārdtra days, and a remainder of \(\frac{118}{199}\) (read \(\frac{118}{199}\)), i.e. the avāmasa. We subtract the ānārdtra days from the lunar days, written in the second place, and the remainder is the civil anayana, i.e. the sum of the civil days, viz. 23,684 (read 23,713).

The method of the Paṇca-Siddhāntika of Varāhamihira is the following: “Take the years of the Šakakāla, subtract therefrom 427. Change the remainder into months by multiplying it by 12. Write down that number in two different places. Multiply the one number by 7 and divide the product by 228. The quotient is the number of adhimāsa months. Add them to the number written down in the second place, multiply the sum by 30, and add to the product the days which have elapsed of the current month. Write down the sum in two different places. Multiply the lower number by 11, add to the product 514, and divide the sum by 703. Subtract the quotient from the number written in the upper place. The remainder you get is the number of the civil days.”

This, Varāhamihira says, is the method of the Siddhānta of the Greeks.

We exemplify this method in one of our gauge-years. From the years of the Šakakāla we subtract 427. The remainder, i.e. 526 years, is equal to 6312 months. The corresponding number of adhimāsa months is 193 and a remainder of \(\frac{1}{6}\). The sum of these months together with the other months is 6505, which are equal to 195,150 lunar days.

The additions which occur in this method are required on account of the fractions of time which adhere to the epoch of the era in question. The multiplication by 7 is for the purpose of reducing the number to seventh parts.
The divisor is the number of sevenths of the time of one adhimāsa, which he reckons as 32 months, 17 days, 8 ghatī, and about 34 cakṣuṣa.

Further, we write down the lunar days in two different places. The lower number we multiply by 11, and add to the product 514. The sum is 2,147,164. Dividing it by 703, we get the quotient 3054, i.e. the anārśa days, and a remainder of 303. We subtract the days from the number in the second place, and get the remainder 192,096, i.e. the civil days of the date on which we base the chronological computations of this book.

The theory of Varāhamihira comes very near that of Brahmagupta; for here the fraction at the end of the number of the adhimāsa days of the gauge-date is \( \frac{1}{5} \), whilst in the calculations which we have made, starting from the beginning of the kalpa, we found it to be \( \frac{1}{120} \), which is nearly equal to \( \frac{1}{7} \) (cf. p. 29).

In a Muhammadan canon or calendar called the canon Al-harkān we find the same method of calculation, but applied to and starting from another era, the epoch of which must fall 40,081 (days) after that of the era of Yazdajird. According to this book, the beginning of the Indian year falls on Sunday the 21st of Dāmāh of the year 110 of Yazdajird. The method may be tested in the following manner:

"Take seventy-two years, change them into months by multiplying them by 12, which gives the product 864. Add thereto the months which have elapsed between the 1st of Sha'bān of the year 197, and the 1st of the month in which you happen to be. Write down the sum in two different places. Multiply the lower number by 7 and divide the product by 224. Add the quotient to the upper number and multiply the sum by 30. Add to the product the number of days which have elapsed of the month in which you are. Write down this number in two different places."
Add 38 to the lower number and multiply the sum by 11. Divide the product by 703, and subtract the quotient from the upper number. The remainder in the upper place is the number of the civil days, and the remainder in the lower place is the number of the avamas. Add 1 to the number of days and divide the sum by 7. The remainder shows the day of the week on which the date in question falls."

This method would be correct if the months of the seventy-two years with which the calculation begins were lunar. However, they are solar months, in which nearly twenty-seven months must be intercalated, so that these seventy-two years are more than 864 months.

We shall again exemplify this method in the case of our gauge-date, i.e. the beginning of Rabî' I., A.H. 422. Between the above-mentioned 1st of Sha'ban and the latter date there have elapsed 2695 months. Adding these to the number of months adopted by the author of the method (864), you get the sum of 3559 months. Write down this number in two places. Multiply the one by 7, and divide the product by 228. The quotient represents the adhîmasa months, viz. 109. Add them to the number in the other place, and you get the sum 3668. Multiply it by 30, and you get the product 110,040. Write down this number in two different places. Add to the lower number 38, and you get 110,078. Multiply it by 11 and divide the product by 703. The quotient is 1722 and a remainder of 292, i.e. the avamas. Subtract the quotient from the upper number, and the remainder, 108,318, represents the civil days.

This method is to be amended in the following way: You must know that between the epoch of the era here used and the first of Sha'ban, here adopted as a date, there have elapsed 25,958 days, i.e. 876 Arabic months, or seventy-three years and two months. If we further
add to this number the months which have elapsed between that 1st Sha'bi and the 1st Rabî' I. of the
gauge-year, we get the sum of 3571, and, together with the adhimaesa months, 3680 months, i.e. 110,400 days.
The corresponding number of ṇnardaṭra days is 1727, and a remainder of 319 avamas. Subtracting these
days, we get the remainder 108,673. If we now sub-
tract 1 and divide the remainder by 7, the computation
is correct, for the remainder is 4, i.e. the day of the
gauge-date is a Wednesday, as has above (p. 48) been
stated.

The method of Durlabha, a native of Multân, is the
following:—He takes 848 years and adds thereto the
Laukika-kâla. The sum is the Śakakâla. He subtracts
therefrom 854, and changes the remainder of years into
months. He writes them down together with the vast
months of the current year in three different places.
The lower number he multiplies by 77, and divides
the product by 69,120. The quotient he subtracts
from the middle number, doubles the remainder, and
adds thereto 29. The sum he divides by 65, so as to
get adhimaesa months. He adds them to the upper
number and multiplies the sum by 30. He writes
down the product together with the past days of the
current month in two different places. He multiplies
the lower number by 11 and adds to the product 686.
The sum he writes underneath. He divides it by
403,963, and adds the quotient to the middle number.
He divides the sum by 703. The quotient represents
the ṇnardaṭra days. He subtracts them from the upper
number. The remainder is the civil ahargana, i.e. the
sum of the civil days of the date in question.

We have already in a former place mentioned the
outlines of this method. After the author, Durlabha,
had adopted it for a particular date, he made some
additions, whilst the bulk of it is unchanged. How-
ever, the Karanâsâra forbids introducing any innovations
which in the method of akṣaraṇa deviate to some other process. Unfortunately that which we possess of the book is badly translated. What we are able to quote from it is the following:

He subtracts 821 from the years of the Śakakāla. The remainder is the basis. This would be the year 132 for our gauge-year. He writes down this number in three different places. He multiplies the first number by 132 degrees. The product gives the number 17,424 for our gauge-date. He multiplies the second number by 46 minutes, and gets the product 6072. He multiplies the third number by 34, and gets the product 4488. He divides it by 50, and the quotient represents minutes, seconds, &c., viz. 89' 46". Then he adds to the sum of degrees in the upper place 112, changing the seconds to minutes, the minutes to degrees, the degrees to circles. Thus he gets 48 circles 358° 41' 45". This is the mean place of the moon when the sun enters Aries.

Further, he divides the degrees of the mean place of the moon by 12. The quotient represents days. The remainder of the division he multiplies by 60, and adds thereto the minutes of the mean place of the moon. He divides the sum by 12, and the quotient represents ghaṭīs and minor portions of time. Thus we get 27° 23' 29", i.e. adhimāsa days. No doubt this number represents the past portion of the adhimāsa month, which is at present in the course of formation.

The author, in regard to the manner in which the measure of the adhimāsa month is found, makes the following remark:

He divides the lunar number which we have mentioned, viz. 132° 46' 34", by 12. Thereby he gets as the portio anni 11° 3' 52" 50", and as the portio mensis 0° 55' 19" 24" 10". By means of the latter portio he computes the duration of the time in which 30 days sum up as 2 years, 8 months, 16 days, 4 ghaṭī, 45
cakaka. Then he multiplies the basis by 29 and gets the product 3828. He adds thereto 20, and divides the sum by 36. The quotient represents the dhanartra days, viz. 106$.  

However, as I have not been able to find the proper explanation of this method, I simply give it as I find it, but I must remark that the amount of dhanartra days which corresponds to a single adhimasa month is 15.$
CHAPTER LIV.

ON THE COMPUTATION OF THE MEAN PLACES OF THE PLANETS.

If we know the number of cycles of the planets in a \textit{kalpa} or \textit{caturyuga}, and further know how many cycles have elapsed at a certain moment of time, we also know that the sum-total of the days of the \textit{kalpa} or \textit{caturyuga} stands in the same relation to the sum-total of the cycles as the past days of the \textit{kalpa} or \textit{caturyuga} to the corresponding amount of planetary cycles. The most generally used method is this:—

The past days of the \textit{kalpa} or \textit{caturyuga} are multiplied by the cycles of the planet, or of its apsis, or of its node which it describes in a \textit{kalpa} or \textit{caturyuga}. The product is divided by the sum-total of the days of the \textit{kalpa} or \textit{caturyuga} accordingly as you reckon by the one or the other. The quotient represents complete cycles. These, however, because not wanted, are disregarded.

The remainder which you get by the division is multiplied by 12, and the product is divided by the sum-total of the days of either \textit{kalpa} or \textit{caturyuga} by which we have already once divided. The quotient represents signs of the ecliptic. The remainder of this division is multiplied by 30, and the product divided by the same divisor. The quotient represents degrees. The remainder of this division is multiplied by 60, and is divided by the same divisor. The quotient represents minutes.
This kind of computation may be continued if we want to have seconds and minor values. The quotient represents the place of that planet according to its mean motion, or the place of that apsis or that node which we wanted to find.

The same is also mentioned by Pulisa, but his method differs, as follows:—"After having found the complete cycles which have elapsed at a certain moment of time, he divides the remainder by 131,493,150. The quotient represents the mean signs of the ecliptic.

"The remainder is divided by 4,383,105. The quotient represents degrees. The fourfold of the remainder is divided by 292,207. The quotient represents minutes. The remainder is multiplied by 60 and the product divided by the last-mentioned divisor. The quotient represents seconds.

"This calculation may be continued, so as to give third parts, fourth parts, and minor values. The quotient thus found is the mean place of the planet which we want to find."

The fact is that Pulisa was obliged to multiply the remainder of the cycles by 12, and to divide the product by the days of a caturyuga, because his whole computation is based on the caturyuga. But instead of doing this, he divided by the quotient which you get if you divide the number of days of a caturyuga by 12. This quotient is the first number he mentions, viz. 131,493,150.

Further, he was obliged to multiply the remainder of the signs of the ecliptic by 30, and to divide the product by the first divisor; but instead of doing this, he divided by the quotient which you get if you divide the first number by 30. This quotient is the second number, viz. 4,383,105.

According to the same analogy, he wanted to divide the remainder of the degrees by the quotient which
you get if you divide the second number by 60. However, making this division, he got as quotient 73,051 and a remainder of ½. Therefore he multiplied the whole by 4, in order that the fractions should be raised to wholes. For the same reason he also multiplies the following remainder by 4; but when he did not get wholes, as has been indicated, he returned to multiplying by 60.

If we apply this method to a kalpa according to the theory of Brahmagupta, the first number, by which the remainder of the cycles is divided, is 1,131,493,037,500. The second number, by which the remainder of the signs of the ecliptic is divided, is 4,383,101,250. The third number, by which the remainder of the degrees is divided, is 73,051,687. In the remainder which we get by this division there is the fraction of ½. Therefore we take the double of the number, viz. 1,146,103,375, and we divide by it the double of the remainder of minutes.

Brahmagupta, however, does not reckon by the kalpa and caturyuga, on account of the enormous sums of their days, but prefers to them the kaliyuga, in order to facilitate the calculation. Applying the preceding method of ahargana to the precise date of the kaliyuga, we multiply its sum of days by the star-cycles of a kalpa. To the product we add the basis, i.e. the remaining cycles which the planet had at the beginning of the kaliyuga. We divide the sum by the civil days of the kaliyuga, viz. 157,791,645. The quotient represents the complete cycles of the planet, which are disregarded.

The remainder we compute in the above-described manner, and thereby we find the mean place of the planet.

The here-mentioned bases are the following for the single planets:
For Mars, 4,308,768,000.
For Mercury, 4,288,896,000.
For Jupiter, 4,313,520,000.
For Venus, 4,304,448,000.
For Saturn, 4,305,312,000.
For the Sun’s apsis, 933,120,000.
For the Moon’s apsis, 1,505,952,000.
For the ascending node, 1,838,592,000 (v. the notes).

At the same moment, i.e. at the beginning of the kaliyuga, sun and moon stood according to their mean motion in 0° of Aries, and there was neither a plus nor a minus consisting of an adhimāsa month or of ānardra days.

In the above-mentioned canones or calendars we find the following method:—“The aharyana, i.e. the sum of the days of the date, is, for each planet respectively, multiplied by a certain number, and the product is divided by another number. The quotient represents complete cycles and fractions of cycles, according to mean motion. Sometimes the computation becomes perfect simply by this multiplication and division. Sometimes, in order to get a perfect result, you are compelled once more to divide by a certain number the days of the date, either such as they are, or multiplied by some number. The quotient must then be combined with the result obtained in the first place.

Sometimes, too, certain numbers are adopted, as e.g. the basis, which must either be added or subtracted for this purpose, in order that the mean motion at the beginning of the era should be computed as beginning with 0° of Aries. This is the method of the books Khaṇḍakāhyaka and Kāraṇatilaka. However, the author of the Kāraṇasāra computes the mean places of the planets for the vernal equinox, and reckons the aharyana from this moment. But these methods are very subtle, and are so numerous, that none of them has
obtained any particular authority. Therefore we refrain from reproducing them, as this would detain us too long and be of no use.

The other methods of the computation of the mean places of the planets and similar calculations have nothing to do with the subject of the present book.
CHAPTER LV.

ON THE ORDER OF THE PLANETS, THEIR DISTANCES AND SIZES.

When speaking of the lokas, we have already given a quotation from the Vishnu-Purāṇa and from the commentary of Patañjali, according to which the place of the sun is in the order of the planets below that of the moon. This is the traditional view of the Hindus. Compare in particular the following passage of the Matsya-Purāṇa:—

"The distance of heaven from the earth is equal to the radius of the earth. The sun is the lowest of all planets. Above him there is the moon, and above the moon are the lunar stations and their stars. Above them is Mercury, then follow Venus, Mars, Jupiter, Saturn, the Great Bear, and above it the pole. The pole is connected with the heaven. The stars cannot be counted by man. Those who impugn this view maintain that the moon at conjunction becomes hidden by the sun, as the light of the lamp becomes invisible in the light of the sun, and she becomes more visible the more she moves away from the sun."

We shall now give some quotations from the books of this school relating to the sun, the moon, and the stars, and we shall combine herewith the views of the astronomers, although of the latter we have only a very slender knowledge.

The Vēyu-Purāṇa says: "The sun has globular shape, fiery nature, and 1000 rays, by which he attracts
the water; 400 of these are for the rain, 300 for the snow, and 300 for the air."

In another passage it says: "Some of them (i.e. the rays) are for this purpose, that the devas should live in bliss; others for the purpose that men should live in comfort, whilst others are destined for the fathers."

In another passage the author of the Vāyu-Purāṇa divides the rays of the sun over the six seasons of the year, saying: "The sun illuminates the earth in that third of the year which commences with 0° of Pisces by 300 rays; he causes rain in the following third by 400 rays, and he causes cold and snow in the remaining third by 300 rays."

Another passage of the same book runs as follows: "The rays of the sun and the wind raise the water from the sea to the sun. Now, if the water dropped down from the sun, it would be hot. Therefore the sun hands the water over to the moon, that it should drop down from the moon cold, and thus refresh the world."

Another passage: "The heat of the sun and his light are one-fourth of the heat and the light of the fire. In the north, the sun falls into the water during the night; therefore he becomes red."

Another passage: "In the beginning there were the earth, water, wind, and heaven. Then Brahmā perceived sparks under the earth. He brought them forth and divided them into three parts. One third of them is the common fire, which requires wood and is extinguished by water. Another third is the sun, and the last third is the lightning. In the animals, too, there is fire, which cannot be extinguished by water. The sun attracts the water, the lightning shines through the rain, but the fire in the animals is distributed over the moist substances by which they nourish themselves."

The Hindus seem to believe that the heavenly bodies nourish themselves by the vapours, which also Aristotle mentions as the theory of certain people. Thus
the author of the *Vishnu-Dharma* explains that “the sun nourishes the moon and the stars. If the sun did not exist, there would not be a star, nor angel, nor man.”

The Hindus believe regarding the bodies of all the stars that they have a globular shape, a watery essence, and that they do not shine, whilst the sun alone is of fiery essence, self-shining, and *per accidens* illuminates other stars when they stand opposite to him. They reckon, according to eyesight, among the stars also such luminous bodies as in reality are not stars, but the lights into which those men have been metamorphosed who have received eternal reward from God, and reside in the height of heaven on thrones of crystal. The *Vishnu-Dharma* says: “The stars are watery, and the rays of the sun illuminate them in the night. Those who by their pious deeds have obtained a place in the height sit there on their thrones, and, when shining, they are reckoned among the stars.”

All the stars are called *tāra*, which word is derived from *tārana*, i.e. the passage. The idea is that those saints have passed through the wicked world and have reached bliss, and that the stars pass through heaven in a circular motion. The word *nakṣattra* is limited to the stars of the lunar stations. As, however, all of these are called fixed stars, the word *nakṣattra* also applies to all the fixed stars; for it means *not increasing and not decreasing*. I for my part am inclined to think that this increasing and decreasing refers to their number and to the distances of the one from the other, but the author of the last-mentioned book (*Vishnu-Dharma*) combines it with their light. For he adds, “as the moon increases and decreases.”

Further, there is a passage in the same book where Mārkandeya says: “The stars which do not perish before the end of the *kalpa* are equal to a *nikharva*, i.e. 1,00,000,000,000. The number of those which fall down before the end of a *kalpa* is unknown. Only he can know it who dwells in the height during a *kalpa*.**
Vajra spoke: "O Markandeya, thou hast lived during six kalpas. This is thy seventh kalpa. Therefore why dost thou not know them?"

He answered: "If they always remained in the same condition, not changing as long as they exist, I should not be ignorant of them. However, they perpetually raise some pious man and bring another down to the earth. Therefore I do not keep them in my memory."

Regarding the diameters of sun and moon and their shadows the Matsya-Purâna says: "The diameter of the body of the sun is 9000 yojanas; the diameter of the moon is the double of it, and the apsis is as much as the two together."

The same occurs in the Vâyu-Purâna, except that it says with regard to the apsis that it is equal to the sun when it is with the sun, and that it is equal to the moon when it is with the moon.

Another author says: "The apsis is 50,000 yojanas."

Regarding the diameters of the planets the Matsya-Purâna says: "The circumference of Venus is one-sixteenth of the circumference of the moon, that of Jupiter three-fourths of the circumference of Venus, that of Saturn or Mars three-fourths of that of Jupiter, that of Mercury three-fourths of that of Mars."

The same statement is also found in the Vâyu-Purâna.

The same two books fix the circumference of the great fixed stars as equal to that of Mercury. The next smaller class have a circumference of 500 yojanas, the following classes 400, 300, and 200. But there are no fixed stars with a smaller circumference than 150 yojanas.

Thus the Vâyu-Purâna. But the Matsya-Purâna says: "The next following classes have a circumference of 400, 300, 200, and 100 yojanas. But there is no fixed star with less circumference than a half yojana."

The latter statement, however, looks suspicious to me, and is perhaps a fault in the manuscript.

The author of Vishnu-Dharma says, relating the
words of Mārkaṇḍeya: "Abhijit, the Falling Eagle; Ārdrā, the Sirius Yemenicus; Rāhiṃṭ, or Aldabaran; Pūnaraśan, i.e. the Two Heads of the Twins; Pushya, Revati, Agastya or Canopus, the Great Bear, the master of Vāyu, the master of Ahiṃbudhnya, and the master of Vasishṭha, each of these stars has a circumference of five yojanas. All the other stars have each only a circumference of four yojanas. I do not know those stars, the distance of which is not measurable. They have a circumference between four yojanas and two kuroh, i.e. two miles. Those which have less circumference than two kuroh are not seen by men, but only by the devas."

The Hindus have the following theory regarding the magnitude of the stars, which is not traced back to any known authority: "The diameters of the sun and moon are each 67 yojanas; that of the apsis is 100; that of Venus 10, of Jupiter 9, of Saturn 8, of Mars 7, of Mercury 7."

This is all we have been able to learn of the confused notions of the Hindus regarding these subjects. We shall now pass on to the views of the Hindu astronomers with whom we agree regarding the order of the planets and other topics, viz. that the sun is the middle of the planets, Saturn and the moon their two ends, and that the fixed stars are above the planets. Some of these things have already been mentioned in the preceding chapters.

Varāhamihira says in the book Sāmkhitā: "The moon is always below the sun, who throws his rays upon her, and lights up the one half of her body, whilst the other half remains dark and shadowy like a pot which you place in the sunshine. The one half which faces the sun is lit up, whilst the other half which does not face it remains dark. The moon is watery in her essence, therefore the rays which fall on her are reflected, as they are reflected from the water and the mirror towards
the wall. If the moon is in conjunction with the sun, the white part of her turns towards the sun, the black part towards us. Then the white part sinks downward towards us slowly, as the sun marches away from the moon.”

Every educated man among the Hindu theologians, and much more so among their astronomers, believes indeed that the moon is below the sun, and even below all the planets.

The only Hindu traditions we have regarding the distances of the stars are those mentioned by Ya‘qub Ibn Tāriq in his book, The Composition of the Spheres, and he had drawn his information from the well-known Hindu scholar who, A.H. 161, accompanied an embassy to Bagdād. First, he gives a metrological statement: “A finger is equal to six barleycorns which are put one by the side of the other. An arm (yard) is equal to twenty-four fingers. A farsakh is equal to 16,000 yards.”

Here, however, we must observe that the Hindus do not know the farsakh, that it is, as we have already explained, equal to one half a yojana.

Further, Ya‘qub says: “The diameter of the earth is 2100 farsakh, its circumference 6596 2\(\frac{3}{4}\) farsakh.”

On this basis he has computed the distances of the planets as we exhibit them in the following table.

However, this statement regarding the size of the earth is by no means generally agreed to by all the Hindus. So, e.g. Pulisa reckons its diameter as 1600 yojanas, and its circumference as 5026\(\frac{1}{2}\) yojanas, whilst Brahmagupta reckons the former as 1581 yojanas, and the latter as 5000 yojanas.

If we double these numbers, they ought to be equal to the numbers of Ya‘qub; but this is not the case. Now the yard and the mile are respectively identical according to the measurement both of us and of the Hindus. According to our computation the radius of the earth is 3184 miles. Reckoning, according to the custom of our
country, 1 farsakh = 3 miles, we get 6728 farsakh; and reckoning 1 farsakh = 16,000 yards, as is mentioned by Ya'kub, we get 5046 farsakh. Reckoning 1 yojana = 32,000 yards, we get 2523 yojanas.

The following table is borrowed from the book of Ya'kub Ibn Tariq:—

<table>
<thead>
<tr>
<th>The planet</th>
<th>Their distances from the centre of the earth, and their diameters.</th>
<th>The conventional measures of the distances, differing according to time and place, reckoned in farsakh, 1 farsakh = 16,000 yards.</th>
<th>Their constant measures, based on the radius of the earth = 1.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius of the earth</td>
<td>1,050</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>The smallest distance</td>
<td>37,500</td>
<td>35½</td>
<td></td>
</tr>
<tr>
<td>The middle distance</td>
<td>48,500</td>
<td>46½</td>
<td></td>
</tr>
<tr>
<td>The greatest distance</td>
<td>59,000</td>
<td>56½</td>
<td></td>
</tr>
<tr>
<td>Diameter of the moon</td>
<td>5,000</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>The smallest distance</td>
<td>64,000</td>
<td>60½</td>
<td></td>
</tr>
<tr>
<td>The middle distance</td>
<td>164,000</td>
<td>156½</td>
<td></td>
</tr>
<tr>
<td>The greatest distance</td>
<td>264,000</td>
<td>251½</td>
<td></td>
</tr>
<tr>
<td>Diameter of Mercury</td>
<td>5,000</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>The smallest distance</td>
<td>259,000</td>
<td>256½</td>
<td></td>
</tr>
<tr>
<td>The middle distance</td>
<td>709,500</td>
<td>675½</td>
<td></td>
</tr>
<tr>
<td>The greatest distance</td>
<td>1,150,000</td>
<td>1,095½</td>
<td></td>
</tr>
<tr>
<td>Diameter of Venus</td>
<td>20,000</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>The smallest distance</td>
<td>1,170,000</td>
<td>1,114½</td>
<td></td>
</tr>
<tr>
<td>The middle distance</td>
<td>1,690,000</td>
<td>1,609½</td>
<td></td>
</tr>
<tr>
<td>The greatest distance</td>
<td>2,210,000</td>
<td>2,104½</td>
<td></td>
</tr>
<tr>
<td>Diameter of the Sun</td>
<td>20,000</td>
<td>19½</td>
<td></td>
</tr>
<tr>
<td>The smallest distance</td>
<td>2,230,000</td>
<td>2,123½</td>
<td></td>
</tr>
<tr>
<td>The middle distance</td>
<td>5,315,000</td>
<td>5,061½</td>
<td></td>
</tr>
<tr>
<td>The greatest distance</td>
<td>8,400,000</td>
<td>8,000</td>
<td></td>
</tr>
<tr>
<td>Diameter of Mars</td>
<td>20,000</td>
<td>19½</td>
<td></td>
</tr>
<tr>
<td>The smallest distance</td>
<td>8,420,000</td>
<td>8,019½</td>
<td></td>
</tr>
<tr>
<td>The middle distance</td>
<td>11,410,000</td>
<td>10,866½</td>
<td></td>
</tr>
<tr>
<td>The greatest distance</td>
<td>14,400,000</td>
<td>13,714½</td>
<td></td>
</tr>
<tr>
<td>Diameter of Jupiter</td>
<td>20,000</td>
<td>19½</td>
<td></td>
</tr>
<tr>
<td>The smallest distance</td>
<td>14,420,000</td>
<td>13,733½</td>
<td></td>
</tr>
<tr>
<td>The middle distance</td>
<td>16,220,000</td>
<td>15,447½</td>
<td></td>
</tr>
<tr>
<td>The greatest distance</td>
<td>18,020,000</td>
<td>17,161½</td>
<td></td>
</tr>
<tr>
<td>Diameter of Saturn</td>
<td>20,000</td>
<td>19½</td>
<td></td>
</tr>
<tr>
<td>The radius of the outside</td>
<td>20,000,000</td>
<td>19,047½</td>
<td></td>
</tr>
<tr>
<td>The radius of the inside</td>
<td>19,962,000</td>
<td>1,865½ (sic)</td>
<td></td>
</tr>
<tr>
<td>Its circumference from the outside</td>
<td>125,664,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Page 234.
This theory differs from that on which Ptolemy has based his computation of the distances of the planets in the *Kitāb-al-Manāshīd*; and in which he has been followed both by the ancient and the modern astronomers. It is their principle that the greatest distance of a planet is equal to its smallest distance from the next higher planet, and that between the two globes there is not a space void of action.

According to this theory, there is between the two globes a space not occupied by either of them, in which there is something like an axis around which the rotation takes place. It seems that they attributed to the ether a certain gravity, in consequence of which they felt the necessity of adopting something which keeps or holds the inner globe (the planet) in the midst of the outer globe (the ether).

It is well known among all astronomers that there is no possibility of distinguishing between the higher and the lower one of two planets except by means of the *occultation* or the increase of the *parallax*. However, the occultation occurs only very seldom, and only the parallax of a single planet, viz. the moon, can be observed. Now the Hindus believe that the motions are equal, but the distances different. The reason why the higher planet moves more slowly than the lower is the greater extension of its sphere (or orbit); and the reason why the lower planet moves more rapidly is that its sphere or orbit is less extended. Thus, e.g. one minute in the sphere of Saturn is equal to 262 minutes in the sphere of the moon. Therefore the times in which Saturn and the moon traverse the same space are different, whilst their motions are equal.

I have never found a Hindu treatise on this subject, but only numbers relating thereto scattered in various books—numbers which are corrupt. Somebody objected to Pulisa that he reckoned the circumference of the sphere of each planet as 21,600, and its radius as 3438,
whilst Varahamihira reckoned the sun’s distance from
the earth as 2,598,900, and the distance of the fixed stars
as 321,362,683. Thereupon Pulisa replied that the for-
mer numbers were minutes, the latter *yojanas*; whilst
in another passage he says that the distance of the fixed
stars from the earth is sixty times larger than the distance
of the sun. Accordingly he ought to have reckoned
the distance of the fixed stars as 155,934,000.

The Hindu method of the computation of the dis-
tances of the planets which we have above mentioned
is based on a principle which is unknown to me in the
present stage of my knowledge, and as long as I have
no facility in translating the books of the Hindus. The
principle is this, that the extension of a minute in the
orbit of the moon is equal to fifteen *yojanas*. The nature
of this principle is not cleared up by the commentaries
of Balabhadra, whatsoever trouble he takes. For he
says: “People have tried to fix by observation the
time of the moon’s passing through the horizon, i.e. the
time between the shining of the first part of her body
and the rising of the whole, or the time between the
beginning of her setting and the completion of the
act of setting. People have found this process to
last thirty-two minutes of the circumference of the
sphere.” However, if it is difficult to fix by observ-
ation the degrees, it is much more so to fix the
minutes.

Further, the Hindus have tried to determine by
observation the *yojanas* of the diameter of the moon,
and have found them to be 480. If you divide them
by the minutes of her body, the quotient is 15 *yojanas*,
as corresponding to one minute. If you multiply it by
the minutes of the circumference, you get the product
324,000. This is the measure of the sphere of the
moon which she traverses in each rotation. If you
multiply this number by the cycles of the moon in a
*kalpa* or *caturyuga*, the product is the distance which
the moon traverses in either of them. According to Brahmagupta, this is in a kalpa 18,712,069,200,000,000 yojanas. Brahmagupta calls this number the yojanas of the ecliptic.

Evidently if you divide this number by the cycles of each planet in a kalpa, the quotient represents the yojanas of one rotation. However, the motion of the planets is, according to the Hindus, as we have already mentioned, in every distance one and the same. Therefore the quotient represents the measure of the path of the sphere of the planet in question.

As further, according to Brahmagupta, the relation of the diameter to the circumference is nearly equal to that of 12,959:49,980, you multiply the measure of the path of the sphere of the planet by 12,959, and divide the product by 81,960. The quotient is the radius, or the distance of the planet from the centre of the earth.

We have made this computation for all the planets according to the theory of Brahmagupta, and present the results to the reader in the following table:—

<table>
<thead>
<tr>
<th>The planets</th>
<th>The circumference of the sphere of each planet, reckoned in yojanas.</th>
<th>Their radii, which are identical with their distances from the earth's centre, reckoned in yojanas.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moon</td>
<td>324,000</td>
<td>51,229</td>
</tr>
<tr>
<td>Mercury</td>
<td>1,043,310</td>
<td>164,947</td>
</tr>
<tr>
<td>Venus</td>
<td>2,664,029</td>
<td>431,315</td>
</tr>
<tr>
<td>Sun</td>
<td>4,331,497</td>
<td>684,869</td>
</tr>
<tr>
<td>Mars</td>
<td>8,146,916</td>
<td>1,288,139</td>
</tr>
<tr>
<td>Jupiter</td>
<td>51,374,821</td>
<td>8,123,064</td>
</tr>
<tr>
<td>Saturn</td>
<td>127,668,787</td>
<td>20,186,186</td>
</tr>
</tbody>
</table>

The Fixed Stars, their distance from the earth's centre being sixty times the distance of the sun from the same.

259,889,850

41,092,140
As Pulisa reckons by caturyugas, not by kalpas, he multiplies the distance of the path of the sphere of the moon by the lunar cycles of a caturyuga, and gets the product 18,712,080,864,000 yojanas, which he calls the yojanas of heaven. It is the distance which the moon traverses in each caturyuga.

Pulisa reckons the relation of the diameter to the circumference as 1250 : 3927. Now, if you multiply the circumference of each planetary sphere by 625 and divide the product by 3927, the quotient is the distance of the planet from the earth's centre. We have made the same computation as the last one according to the view of Pulisa, and present the results in the following table. In computing the radii we have disregarded the fractions smaller than \( \frac{1}{2} \), and have reduced larger fractions to wholes. We have, however, not taken the same liberty in the calculation of the circumferences, but have calculated with the utmost accuracy, because they are required in the computations of the revolutions. For if you divide the yojanas of heaven in a kalpa or caturyuga by the civil days of the one or the other, you get the quotient 11,858 plus a remainder, which is \( \frac{2.110}{3} \) according to Brahmagupta, and \( \frac{2.584}{3} \) according to Pulisa. This is the distance which the moon every day traverses, and as the motion of all planets is the same, it is the distance which every planet in a day traverses. It stands in the same relation to the yojanas of the circumference of its sphere as its motion, which we want to find, to the circumference, the latter being divided into 360 equal parts. If you therefore multiply the path common to all the planets by 360 and divide the product by the yojanas of the circumference of the planet in question, the quotient represents its mean daily motion.
<table>
<thead>
<tr>
<th>The planets.</th>
<th>The circumferences of the spheres of the planets, reckoned in yojanas.</th>
<th>The distances of the planets from the earth's centre, reckoned in yojanas.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moon</td>
<td>324,000</td>
<td>51,566</td>
</tr>
<tr>
<td>Mercury</td>
<td>1,043,211</td>
<td>166,033</td>
</tr>
<tr>
<td>Venus</td>
<td>2,664,632</td>
<td>424,089</td>
</tr>
<tr>
<td>Sun</td>
<td>4,331,500</td>
<td>690,295 (sic)</td>
</tr>
<tr>
<td>Mars</td>
<td>8,146,937</td>
<td>1,296,624 (1)</td>
</tr>
<tr>
<td>Jupiter</td>
<td>51,375,764</td>
<td>8,176,689 (1)</td>
</tr>
<tr>
<td>Saturn</td>
<td>127,671,739</td>
<td>20,319,542 (1)</td>
</tr>
<tr>
<td>The Fixed Stars, the sun's distance from the earth's centre being 1/16th of theirs</td>
<td>259,890,012</td>
<td>41,417,700 (sic)</td>
</tr>
</tbody>
</table>

As, now, the minutes of the diameter of the moon stand in the same relation to the minutes of her circumference, i.e. 21,600, as the number of yojanas of the diameter, i.e. 480, to the yojanas of the circumference of the whole sphere, exactly the same method of calculation has been applied to the minutes of the diameter of the sun, which we have found to be equal to 6522 yojanas according to Brahmagupta, and equal to 6480 according to Pulisa. Since Pulisa reckons the minutes of the body of the moon as 32, i.e. a power of 2, he divides this number in order to get the minutes of the bodies of the planets by 2, till he at last gets 1. Thus, he attributes to the body of Venus 1/2 of 32 minutes, i.e. 16; to that of Jupiter 1/4 of 32 minutes, i.e. 8; to that of Mercury 1/8 of 32 minutes, i.e. 4; to that of Saturn 1/16 of 32 minutes, i.e. 2; to that of Mars 1/32 of 32 minutes, i.e. 1.

This precise order seems to have taken his fancy, or he would not have overlooked the fact that the diameter of Venus is, according to observation, not equal to the radius of the moon, nor Mars equal to 1/16th of Venus.

The following is the method of the computation of the bodies of sun and moon at every time, based on their distances from the earth, i.e. the true diameter.
of its orbit, which is found in the computations of the corrections of sun and moon. AB is the diameter of the body of the sun, CD is the diameter of the earth, CDH is the cone of the shadow, HL is its elevation. Further, draw CR parallel to DB. Then is AR the difference between AB and CD, and the normal line CT is the middle distance of the sun, i.e. the radius of its orbit derived from the yojanas of heaven (v. p. 72). From this the true distance of the sun always differs, sometimes being larger, sometimes smaller. We draw CK, which is of course determined by the parts of the sine. It stands in the same relation to CT, this being the *sinus totus* (radius), as the yojanas of CK to the yojanas of CT. Hereby the measure of the diameter is reduced to yojanas.

The yojanas of AB stand in the same relation to the yojanas of TC as the minutes of AB to the minutes of TC, the latter being the *sinus totus*. Thereby AB becomes known and determined by the minutes of the sphere, because the *sinus totus* is determined by the measure of the circumference. For this reason Pulisa says: “Multiply the yojanas of the radius of the sphere of the sun or the moon by the true distance, and divide the product by the *sinus totus*. By the quotient you get for the sun, divide 22,278,240, and by the quotient you get for the moon, divide 1,650,240. The quotient then represents the minutes of the diameter of the body of either sun or moon.”

The last-mentioned two numbers are products of the multiplication of the yojanas of the diameters of sun and moon by 3438, which is the number of the minutes of the *sinus totus*.

Likewise Brahmagupta says: “Multiply the yojanas of sun or moon by 3416, i.e. the minutes of the *sinus totus*, and divide the product by the yojanas of the radius of the sphere of sun or moon.” But the latter rule of division is not correct, because, according to it,
the measure of the body would not vary (v. p. 74). Therefore the commentator Balabhādra holds the same opinion as Pulisa, viz. that the divisor in this division should be the true distance reduced (to the measure of yojanas).

Brahmagupta gives the following rule for the computation of the diameter of the shadow, which in our canones is called the measure of the sphere of the dragon’s head and tail: “Subtract the yojanas of the diameter of the earth, i.e. 1581, from the yojanas of the diameter of the sun, i.e. 6522. There remains 4941, which is kept in memory to be used as divisor. It is represented in the figure by AR. Further multiply the diameter of the earth, which is the double sinus totus, by the yojanas of the true distance of the sun, which is found by the correction of the sun. Divide the product by the divisor kept in memory. The quotient is the true distance of the shadow’s end.

“Evidently the two triangles ARC and CDH are similar to each other. However, the normal line CT does not vary in size, whilst in consequence of the true distance the appearance of AB varies, though its size is constantly the same. Now let this distance be CK. Draw the lines AJ and R V parallel to each other, and JKV parallel to AB. Then the latter is equal to the divisor kept in memory.

“Draw the line JCM. Then M is the head of the cone of the shadow for that time. The relation of JV, the divisor kept in memory, to KC, the true distance, is the same as that of CD, the diameter of the earth, to ML, which he (Brahmagupta) calls a true distance (of the shadow’s end), and it is determined by the minutes of the sine (the earth’s radius being the sinus totus).

For KC——”

Now, however, I suspect that in the following something has fallen out in the manuscript, for the author continues: “Then multiply it (i.e. the quotient of CK,}
by the divisor kept in memory) by the diameter of the earth. The product is the distance between the earth's centre and the end of the shadow. Subtract therefrom the true distance of the moon and multiply the remainder by the diameter of the earth. Divide the product by the true distance of the shadow's end. The quotient is the diameter of the shadow in the sphere of the moon. Further, we suppose the true distance of the moon to be LS, and FN is a part of the lunar sphere, the radius of which is LS. Since we have found LM as determined by the minutes of the sine, it stands in the same relation to CD, this being the double sinus totus, as MS, measured in minutes of the sine, to XZ, measured in minutes of the sine."

Here I suppose Brahmagupta wished to reduce LM, the true distance of the shadow's end, to yojanas, which is done by multiplying it by the yojanas of the diameter of the earth, and by dividing the product by the double sinus totus. The mentioning of this division has fallen out in the manuscript; for without it the multiplication of the corrected distance of the shadow's end by the diameter of the earth is perfectly superfluous, and in no way required by the computation.

Further: "If the number of yojanas of LM is known, LS, which is the true distance, must also be reduced to yojanas, for the purpose that MS should be determined by the same measure. The measure of the diameter of the shadow which is thus found represents yojanas.

Further, Brahmagupta says: "Then multiply the shadow which has been found by the sinus totus, and divide the product by the true distance of the moon. The quotient represents the minutes of the shadow which we wanted to find."

However, if the shadow which he has found were determined by yojanas, he ought to have multiplied it by the double sinus totus, and to have divided the product by the yojanas of the diameter of the earth, in
order to find the minutes of the shadow. But as he has not done so, this shows that, in his computation; he limited himself to determining the true diameter in minutes, without reducing it to yojanas.

The author uses the true (sphuta) diameter without its having been reduced to yojanas. Thus he finds that the shadow in the circle, the radius of which is LS, is the true diameter, and this is required for the computation of the circle, the radius of which is the sinus totus. The relation of ZX, which he has already found, to SL, the true distance, is the same as the relation of ZX in the measure which is sought to SL, this being the sinus totus. On the basis of this equation the reduction (to yojanas) must be made.

In another passage Brahmagupta says: “The diameter of the earth is 1581, the diameter of the moon 480, the diameter of the sun 6522, the diameter of the shadow 1581. Subtract the yojanas of the earth from the yojanas of the sun, there remains 4941. Multiply this remainder by the yojanas of the true distance of the moon, and divide the product by the yojanas of the true distance of the sun. Subtract the quotient you get from 1581, and the remainder is the measure of the shadow in the sphere of the moon. Multiply it by 3416, and divide the product by the yojanas of the middle radius of the sphere of the moon. The quotient represents the minutes of the diameter of the shadow.

“Evidently if the yojanas of the diameter of the earth are subtracted from the yojanas of the diameter of the sun, the remainder is AR, i.e. JV. Draw the line VCF and let fall the normal line KC on O. Then the relation of the surplus JV to KC, the true distance of the sun, is the same as the relation of ZF to OC, the true distance of the moon. It is indifferent whether these two mean diameters are reduced (to yojanas) or not, for ZF is, in this case, found as determined by the measure of yojana.

“Draw XN as equal to OF. Then ON is necessarily
equal to the diameter of CD, and its sought-for part is ZX. The number which is thus found must be subtracted from the diameter of the earth, and the remainder will be ZX."

For such mistakes as occur in this computation, the author, Brahmagupta, is not to be held responsible, but we rather suspect that the fault lies with the manuscript. We, however, cannot go beyond the text we have at our disposal, as we do not know how it may be in a correct copy.

The measure of the shadow adopted by Brahmagupta, from which he orders the reader to subtract, cannot be a mean one, for a mean measure stands in the midst, between too little and too much. Further, we cannot imagine that this measure should be the greatest of the measures of the shadow, including the plus (?); for ZF, which is the minus, is the base of a triangle, of which the one side, FC, cuts SL in the direction of the sun, not in the direction of the end of the shadow. Therefore ZF has nothing whatsoever to do with the shadow (conjectural rendering.)
Lastly, there is the possibility that the minus belongs to the diameter of the moon. In that case the relation of ZX, which has been determined in yojanas, to SL, the yojanas of the true distance of the moon, is the same as the relation of ZX reckoned in minutes to SL, this being the sinus totus (conjectural rendering.)

By this method is found what Brahmagupta wants to find, quite correctly, without the division by the mean radius of the sphere of the moon, which is derived from the yojanas of the sphere of heaven (v. p. 72). (For the last three passages vide Notes.)

The methods of the computation of the diameters of sun and moon, as given by the Hindu canones, such as the Khandakhadyaka and Karanastra, are the same as are found in the canon of Alkhwārizmi. Also the computation of the diameter of the shadow in the Khandakhadyaka is similar to that one given by Alkhwārizmi, whilst the Karanastāra has the following method:—
“Multiply the bhukti of the moon by 4 and the bhukti of the sun by 13. Divide the difference between the two products by 30, and the quotient is the diameter of the shadow.”

The Karanatilaka gives the following method for the computation of the diameter of the sun:—“Divide the bhukti of the sun by 2, and write down the half in two different places. In the one place divide it by 10, and add the quotient to the number in the second place. The sum is the number of minutes of the diameter of the sun.”

In the computation of the diameter of the moon, he first takes the bhukti of the moon, adds thereto 1/6th of it, and divides the number by 25. The quotient is the number of the minutes of the moon’s diameter.

In the computation of the diameter of the shadow, he multiplies the bhukti of the sun by 3, and from the product he subtracts 1/14th of it. The remainder he subtracts from the bhukti of the moon, and the double of
the remainder he divides by 15. The quotient is the number of the minutes of the dragon's head and tail.

If we would indulge in further quotations from the canones of the Hindus, we should entirely get away from the subject of the present book. Therefore we restrict ourselves to quote from them only subjects more or less connected with the special subject of this book, which either are noteworthy for their strangeness, or which are unknown among our people (the Muslims) and in our (the Muslim) countries.
CHAPTER LVI.
ON THE STATIONS OF THE MOON.

The Hindus use the lunar stations exactly in the same way as the zodiacal signs. As the ecliptic is, by the zodiacal signs, divided into twelve equal parts, so, by the lunar stations, it is divided into twenty-seven equal parts. Each station occupies $13\frac{1}{2}$ degrees, or 800 minutes of the ecliptic. The planets enter into them and leave them again, and wander to and fro through their northern and southern latitudes. The astrologers attribute to each station a special nature, the quality of foreboding events, and other particular characteristic traits, in the same way as they attribute them to the zodiacal signs.

The number 27 rests on the fact that the moon passes through the whole ecliptic in 27$\frac{1}{2}$ days, in which number the fraction of $\frac{1}{2}$ may be disregarded. In a similar way, the Arabs determine their lunar stations as beginning with the moon's first becoming visible in the west till her ceasing to be visible in the east. Herein they use the following method:

Add to the circumference the amount of the revolution of the sun in a lunar month. Subtract from the sum the march of the moon for the two days called almihak (i.e. the 28th and 29th days of a lunation). Divide the remainder by the march of the moon for one day. The quotient is 27 and a little more than $\frac{1}{2}$, which fraction must be counted as a whole day.

However, the Arabs are illiterate people, who can neither write nor reckon. They only rely upon numbers and eyesight. They have no other medium of research than eyesight, and are not able to determine the lunar stations without the fixed stars in them. If the Hindus
want to describe the single stations, they agree with the Arabs regarding certain stars, whilst regarding others they differ from them. On the whole, the Arabs keep near to the moon’s path, and use, in describing the stations, only those fixed stars with which the moon either stands in conjunction at certain times, or through the immediate neighbourhood of which she passes.

The Hindus do not strictly follow the same line, but also take into account the various positions of one star with reference to the other, e.g. one star’s standing in opposition or in the zenith of another. Besides, they reckon also the Falling Eagle among the stations, so as to get 28.

It is this which has led our astronomers and the authors of ‘awd books astray; for they say that the Hindus have twenty-eight lunar stations, but that they leave out one which is always covered by the rays of the sun. Perhaps they may have heard that the Hindus call that station in which the moon is, the burning one; that station which it has just left, the left one after the embrace; and that station in which she will enter next, the smoking one. Some of our Muslim authors have maintained that the Hindus leave out the station Al-zuband, and account for it by declaring that the moon’s path is burning in the end of Libra and the beginning of Scorpio.

All this is derived from one and the same source, viz. their opinion that the Hindus have twenty-eight stations, and that under certain circumstances they drop one. Whilst just the very opposite is the case; they have twenty-seven stations, and under certain circumstances add one.

Brahmagupta says that in the book of the Veda there is a tradition, derived from the inhabitants of Mount Meru, to this effect, that they see two suns, two moons, and fifty-four lunar stations, and that they have double the amount of days of ours. Then he tries to refute this theory by the argument that we do not see the fish (sic) of the pole revolve twice in a day, but only once. I for
my part have no means of arraying this erroneous sentence in a reasonable shape.

The proper method for the computation of the place of a star or of a certain degree of a lunar station is this:—Method for computing the place of any given degree of a lunar station.

Take its distance from $0^\circ$ Aries in minutes, and divide them by 800. The quotient represents whole stations preceding that station in which the star in question stands.

Then remains to be found the particular place within the station in question. Now, either star or degree is simply determined according to the 800 parts of the station, and reduced by a common denominator, or the degrees are reduced to minutes, or they are multiplied by 60 and the product is divided by 800, in which case the quotient represents that part of the station which the moon has in that moment already traversed, if the station is reckoned as $\frac{1}{5}$.

These methods of computation suit as well the moon as the planets and other stars. The following, however, applies exclusively to the moon:—The product of the multiplication of the remainder (i.e. the portion of the incomplete lunar station) by 60 is divided by the bhukti of the moon. The quotient shows how much of the lunar nakshatra day has elapsed.

The Hindus are very little informed regarding the fixed stars. I never came across any one of them who knew the single stars of the lunar stations from eyesight, and was able to point them out to me with his fingers. I have taken the greatest pains to investigate this subject, and to settle most of it by all sorts of comparisons, and have recorded the results of my research in a treatise on the determination of the lunar stations. Of their theories on this subject I shall mention as much as I think suitable in the present context. But before, that I shall give the positions of the stations in longitude and latitude and their numbers, according to the canon Khandakāhādyaka, facilitating the study of the subject by comprehending all details in the following table:—
<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Number of Lunar Stations</th>
<th>Longitude</th>
<th>Latitude</th>
<th>Northern or Southern Latitude</th>
<th>Notes on the Stars of Which the Lunar Stations Consist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aśvinī</td>
<td>3</td>
<td>0 3 0</td>
<td>10 0</td>
<td>Northern</td>
<td>Alaharaśāna.</td>
</tr>
<tr>
<td>2</td>
<td>Bharasī</td>
<td>3</td>
<td>0 20 0</td>
<td>12 0</td>
<td>Northern</td>
<td>Albutain.</td>
</tr>
<tr>
<td>3</td>
<td>Krittikā</td>
<td>6</td>
<td>1 7 23</td>
<td>5 0</td>
<td>Northern</td>
<td>Alithurayā.</td>
</tr>
<tr>
<td>4</td>
<td>Rohiṣṇī</td>
<td>5</td>
<td>1 19 28</td>
<td>5 0</td>
<td>Southern</td>
<td>Aldaharā, together with the stars of the head of Taurus.</td>
</tr>
<tr>
<td>5</td>
<td>Mṛgadāraha</td>
<td>3</td>
<td>3 3 0</td>
<td>5 0</td>
<td>Southern</td>
<td>Alḥaṣa.</td>
</tr>
<tr>
<td>6</td>
<td>Āṇḍraśī</td>
<td>1</td>
<td>3 7 0</td>
<td>11 0</td>
<td>Southern</td>
<td>Unknown. Most likely identical with Canis Minor.</td>
</tr>
<tr>
<td>7</td>
<td>Panarvasu</td>
<td>2</td>
<td>3 3 0</td>
<td>6 0</td>
<td>Without any latitude</td>
<td>Aldhīrā.</td>
</tr>
<tr>
<td>8</td>
<td>Puṣya</td>
<td>1</td>
<td>3 16 0</td>
<td>0 0</td>
<td>Without any latitude</td>
<td>Alnathra.</td>
</tr>
<tr>
<td>9</td>
<td>Āḷalasāha</td>
<td>6</td>
<td>3 18 0</td>
<td>6 0</td>
<td>Southern</td>
<td>Unknown. Most likely identical with two stars of Cancer</td>
</tr>
<tr>
<td>10</td>
<td>Maγhā</td>
<td>6</td>
<td>4 9 0</td>
<td>0 0</td>
<td>Without any latitude</td>
<td>Aljaḥba, together with two other stars.</td>
</tr>
<tr>
<td>11</td>
<td>Pārvaphālgunī</td>
<td>2</td>
<td>4 27 0</td>
<td>12 0</td>
<td>Northern</td>
<td>Alṣubha.</td>
</tr>
<tr>
<td>12</td>
<td>Uttaraphālgunī</td>
<td>2</td>
<td>5 3 0</td>
<td>13 0</td>
<td>Northern</td>
<td>Alṣafā, together with the third star of Alṣaffra.</td>
</tr>
<tr>
<td>Page</td>
<td>Name</td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>13</td>
<td>Hasta</td>
<td>5</td>
<td>5</td>
<td>20</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>14</td>
<td>Cittä</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Svāti</td>
<td>1</td>
<td>6</td>
<td>19</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>16</td>
<td>Viśākhā</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>Anurādhā</td>
<td>4</td>
<td>7</td>
<td>14</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>18</td>
<td>Jyeshaṭā</td>
<td>3</td>
<td>7</td>
<td>19</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>Māla</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>20</td>
<td>Pārvabhāṣā</td>
<td>4</td>
<td>8</td>
<td>14</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>Uttārabhāṣā</td>
<td>4</td>
<td>8</td>
<td>20</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>22</td>
<td>Abhijit</td>
<td>3</td>
<td>8</td>
<td>25</td>
<td>0</td>
<td>62</td>
</tr>
<tr>
<td>23</td>
<td>Śravaṇa</td>
<td>3</td>
<td>9</td>
<td>8</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>24</td>
<td>Dhanishṭā</td>
<td>5</td>
<td>9</td>
<td>20</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>25</td>
<td>Śatabhishaj</td>
<td>1</td>
<td>10</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>Pārvabhāḍrapāda</td>
<td>2</td>
<td>10</td>
<td>26</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>27</td>
<td>Uttārabhāḍrapāda</td>
<td>2</td>
<td>11</td>
<td>6</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>28</td>
<td>Revati</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

CHAPTER LVII.
The notions of the Hindus regarding the stars are not free from confusion. They are only little skilled in practical observation and calculation, and have no understanding of the motions of the fixed stars. So Varāhamihira says in his book *Samhitā*: “In six stations, beginning with Revati and ending with Mrigasira, observation precedes calculation, so that the moon enters each one of them earlier according to eyesight than according to calculation.

“In twelve stations, beginning with Årdrā and ending with Anurādhā, the precession is equal to half a station, so that the moon is in the midst of a station according to observation, whilst she is in its first part according to calculation.

“In the nine stations, beginning with Jyesṭhā and ending with Uttarabhadrapadā, observation falls back behind calculation, so that the moon enters each of them according to observation, when, according to calculation, she leaves it in order to enter the following.”

My remark relating to the confused notions of the Hindus regarding the stars is confirmed, though this is perhaps not apparent to the Hindus themselves, e.g. by the note of Varāhamihira regarding *Alśaratān* = Aśvini, one of the first-mentioned six stations; for he says that in observation precedes calculation. Now the two stars of Aśvini stand, in our time, in two-thirds of Aries (i.e. between 10°–20° Aries), and the time of Varāhamihira precedes our time by about 526 years. Therefore by whatever theory you may compute the motion of the fixed stars (or precession of the equinoxes), the Aśvini did, in his time, certainly not stand in less than one-third of Aries (i.e. they had not come in the precession of the equinoxes farther than to 1°–10° Aries).

Supposing that, in his time, Aśvini really stood in this part of Aries or near it, as is mentioned in the *Khandakādhyaka*, which gives the computation of sun
and moon in a perfectly correct form, we must state that at that time there was not yet known what is now known, viz. the retrograde motion of the star by the distance of eight degrees. How, therefore, could, in his time, observation precede calculation, since the moon, when standing in conjunction with the two stars, had already traversed nearly two-thirds of the first station? According to the same analogy, also, the other statements of Varāhamihira may be examined.

The stations occupy a smaller or larger space according to their figures, i.e. their constellations, not they themselves, for all stations occupy the same space on the ecliptic. This fact does not seem to be known to the Hindus, although we have already related similar notions of theirs regarding the Great Bear. For Brahmagupta says in the Uttara-khaṇḍakhādyaka, i.e. the emendation of the Khaṇḍa-khādyaka:—

"The measure of some stations exceeds the measure of the mean daily motion of the moon by one half. Accordingly their measure is 19° 45' 52" 18". There are six stations, viz. Rohini, Punarvasu, Uttaraphalguni, Visākhā, Uttarāśādhā, Uttarabhādrapada. These together occupy the space of 118° 35' 13" 48". Further six stations are short ones, each of them occupying less than the mean daily motion of the moon by one half. Accordingly their measure is 6° 35' 17" 26". These are Bharani, Ārdra, Āśleha, Svati, Jyeshta, Śatabhishaj. They together occupy the space of 39° 31' 44" 36". Of the remaining fifteen stations, each occupies as much as the mean daily motion. Accordingly it occupies the space of 13° 10' 34" 52". They together occupy the space of 197° 38' 43". These three groups of stations together occupy the space of 355° 45' 41" 24", the remainder of the complete circle 4° 14' 18" 36", and this is the space of Abhijit, i.e. the Falling Eagle, which is left out. I have tried to make the investigation of this subject acceptable to the
student in my above-mentioned special treatise on the lunar stations (v. p. 83).

The scantiness of the knowledge of the Hindus regarding the motion of the fixed stars is sufficiently illustrated by the following passage from the *Samhita* of Varâhamihira:—"It has been mentioned in the books of the ancients that the summer solstice took place in the midst of Âslešhâ, and the winter solstice in Dhanîshṭhâ. And this is correct for that time. Nowadays the summer solstice takes place in the beginning of Cancer, and the winter solstice in the beginning of Capricornus. If any one doubts this, and maintains that it is as the ancients have said and not as we say, let him go out to some level country when he thinks that the summer solstice is near. Let him there draw a circle, and place in its centre some body which stands perpendicular on the plain. Let him mark the end of its shadow by some sign, and continue the line till it reaches the circumference of the circle either in east or west. Let him repeat the same at the same moment of the following day, and make the same observation. When he then finds that the end of the shadow deviates from the first sign towards the south, he must know that the sun has moved towards the north and has not yet reached its solstice. But if he finds that the end of the shadow deviates towards the north, he knows that the sun has already commenced to move southward and has already passed its solstice. If a man continues this kind of observations, and thereby finds the day of the solstice, he will find that our words are true."

This passage shows that Varâhamihira had no knowledge of the motion of the fixed stars towards the east. He considers them, in agreement with the name, as *fixed*, immovable stars, and represents the solstice as moving towards the west. In consequence of this fancy, he has, in the matter of the lunar stations, confounded
two things, between which we shall now properly distinguish, in order to remove doubt and to give the matter in a critically emended form.

In the order of the zodiacal signs we begin with that twelfth part of the ecliptic which lies north of the point of intersection of the equator and the ecliptic according to \textit{the second motion}, \textit{i.e.} the precession of the equinoxes. In that case, the summer solstice always occurs at the beginning of the fourth sign, the winter solstice at the beginning of the tenth sign.

In the order of the lunar stations we begin with that twenty-seventh part of the ecliptic which belongs to the first of the first zodiacal sign. In that case the summer solstice falls always on three-fourths of the seventh station \textit{(i.e. on 600\degree of the station)}, and the winter solstice on one fourth of the twenty-first station \textit{(i.e. on 200\degree of the station)}. This order of things will remain the same as long as the world lasts.

If, now, the lunar stations are marked by certain constellations, and are called by names peculiar to these constellations, the stations wander round together with the constellations. The stars of the zodiacal signs and of the stations have, in bygone times, occupied earlier \textit{(i.e. more western)} parts of the ecliptic. From them they have wandered into those which they occupy at present, and in future they will wander into other still more eastern parts of the ecliptic, so that in the course of time they will wander through the whole ecliptic.

According to the Hindus, the stars of the station \textit{Âsleshâ} stand in 18\degree of Cancer. Therefore, according to the rate of the precession of the equinoxes adopted by the ancient astronomers, they stood 1800 years before our time in the 0\degree of the fourth sign, whilst the constellation of Cancer stood in the third sign, in which there was also the solstice. The solstice has kept its place, but the constellations have migrated, just the very opposite of what Varâhamihira has fancied.
CHAPTER LVII.

ON THE HELIACAL RISINGS OF THE STARS, AND ON THE CEREMONIES AND RITES WHICH THE HINDUS PRACTISE AT SUCH A MOMENT.

The Hindu method for the computation of the heliacal risings of the stars and the young moon is, as we think, the same as is explained in the canon called *Sindhind*. They call the degrees of a star's distance from the sun which are thought necessary for its heliacal rising *kālāmśaka*. They are, according to the author of the *Ghurrat-al-zijāt*, the following:—13° for Suhail, Alyamāniya, Alwāki, Al’ayyūk, Alsimākān, Ḳalb-al’akrab; 20° for Albuṭain, Albaḳ’a, Alnathra, Āḍleshā, Śatabhishaj, Revat; 14° for the others.

Evidently the stars have, in this respect, been divided into three groups, the first of which seems to comprise the stars reckoned by the Greeks as stars of the first and second magnitude, the second the stars of the third and fourth magnitude, and the third the stars of the fifth and sixth magnitude.

Brahmagupta ought to have given this classification in his emendation of the *Khaṇḍakādyaka*, but he has not done so. He expresses himself in general phrases, and simply mentions 14° distance from the sun as necessary for the heliacal risings of all lunar stations.

Vijayanandin says: "Some stars are not covered by the rays nor impaired in their shining by the sun, viz. Al’ayyūk, Alsimāk, Alrāmiḥ, the two Eagles, Dhanishṭā, and UttarabhādраОdā, because they have so much
northern latitude, and because also the country (of the observer) has so much latitude. For in the more northern regions they are seen both at the beginning and end of one and the same night, and never disappear."

They have particular methods for the computation of the heliacal rising of Agastya, i.e. Suhail or Canopus. They observe it first when the sun enters the station Hasta, and they lose it out of sight when he enters the station Rohini. Pulisa says: "Take double the apsis of the sun. If it is equalled by the corrected place of the sun, this is the time of the heliacal setting of Agastya."

The apsis of the sun is, according to Pulisa, 2\(\frac{3}{4}\) zodiacal signs. The double of it falls in 10° of Spica, which is the beginning of the station Hasta. Half the apsis falls on 10° of Taurus, which is the beginning of the station Rohini.

Brahmagupta maintains the following in the emendation of the *Khandakhadyaka*:

"The position of Suhail is 27° Orion, its southern latitude 71 parts. The degrees of its distance from the sun necessary for its heliacal rising are 12.

"The position of Mrigavyadhha, i.e. Sirius Yemenicus, is 26° Orion, its southern latitude 40 parts. The degrees of its distance from the sun necessary for its heliacal rising are 13. If you want to find the time of their risings, imagine the sun to be in the place of the star. That amount of the day which has already elapsed is the number of degrees of its distance from the sun necessary for its heliacal rising. Fix the *ascendens* on this particular place. When, then, the sun reaches the degree of this *ascendens*, the star first becomes visible.

"In order to find the time of the heliacal setting of a star, add to the degree of the star six complete zodiacal signs. Subtract from the sum the degrees of its distance from the sun necessary for its heliacal rising, and
fix the ascenden on the remainder. When, then, the
sun enters the degree of the ascenden, that is the time
of its setting."

The book Samhita mentions certain sacrifices and
ceremonies which are practised at the heliacal risings
of various stars. We shall now record them, translating
also that which is rather chaff than wheat, since we
have made it obligatory on ourselves to give the quo-
tations from the books of the Hindus complete and exactly
as they are.

Varahamihira says: "When in the beginning the sun
had risen, and in his revolution had come to stand in the
zenith of the towering mountain Vindhya, the latter
would not recognise his exalted position, and, actuated
by haughtiness, moved towards him to hinder his
march and to prevent his chariot from passing above
it. The Vindhya rose even to the neighbourhood of
Paradise and the dwellings of the Vidyadharas, the
spiritual beings. Now the latter hastened to it because
it was pleasant and its gardens and meadows were
lovely, and dwelt there in joy; their wives going to
and fro, and their children playing with each other.
When the wind blew against the white garments of
their daughters, they flew like waving banners.

In its ravines the wild animals and the lions ap-
pear as dark black, in consequence of the multitude
of the animals called kramara, which cling to them,
liking the dirt of their bodies when they rub each other
with the soiled claws. When they attack the rutting
elephants, the latter become raving. The monkeys and
bears are seen climbing up to the horns of Vindhya
and to its lofty peaks; as if by instinct, they took the
direction towards heaven. The anchorites are seen at
its water-places, satisfied with nourishing themselves
by its fruits. The further glorious things of the Vin-
dhya are innumerable.

When, now, Agastya, the son of Varuna (i.e. Suhail,
the son of the water), had observed all these proceedings of the Vindhya, he offered to be his companion in his aspirations, and asked him to remain in his place until he (Agastya) should return and should have freed him (Vindhya) from the darkness which was on him.

V. 1.—Then Agastya turned towards the ocean, devouring its water, so that it disappeared. There appeared the lower parts of the mountain Vindhya, whilst the makara and the water animals were clinging to it. They scratched the mountain till they pierced it and dug mines in it, in which there remained gems and pearls.

V. 2.—The ocean became adorned by them, further by trees which grew up, though it (the water) was feeble, and by serpents rushing to and fro in windings on its surface.

V. 3.—The mountain has, in exchange for the wrong done to it by Suhail, received the ornament which it has acquired, whence the angels got tiaras and crowns made for themselves.

V. 4.—Likewise the ocean has, in exchange for the sinking down of its water into the depth, received the sparkling of the fishes when they move about in it, the appearance of jewels at its bottom, and the rushing to and fro of the serpents and snakes in the remainder of its water. When the fishes rise over it, and the conch-shells and pearl-oysters, you would take the ocean for ponds, the surface of their water being covered with the white lotus in the season of sarad and the season of autumn.

V. 5.—You could scarcely distinguish between this water and heaven, because the ocean is adorned with jewels as the heaven is adorned with stars; with many-headed serpents, resembling threads of rays which come from the sun; with crystal in it, resembling the body of the moon, and with a white mist, above which rise the clouds of heaven.

V. 6.—How should I not praise him who did this
great deed, who pointed out to the angels the beauty of the crowns, and made the ocean and the mountain Vindhya a treasure-house for them!

V. 7.—That is Suhail, by whom the water becomes clean from earthly defilement, with which the purity of the heart of the pious man is commingled, clean, I say, from that which overpowers him in the intercourse with the wicked.

V. 8.—Whenever Agastya rises and the water increases in the rivers and valleys during his time, you see the rivers offering to the moon all that is on the surface of their water, the various kinds of white and red lotus and the papyrus; all that swims in them, the ducks and the geese (pelicans?), as a sacrifice unto him, even as a young girl offers roses and presents when she enters them (the rivers).

V. 9.—We compare the standing of the pairs of red geese on the two shores, and the swimming to and fro of the white ducks in the midst while they sing, to the two lips of a beautiful woman, showing her teeth when she laughs for joy.

V. 10.—Nay, we compare the black lotus, standing between white lotus, and the dashing of the bees against it from desire of the fragrancy of its smell, with the black of her pupil within the white of the ring, moving coquettishly and amorously, being surrounded by the hair of the eyebrows.

V. 11.—When you then see the ponds, when the light of the moon has risen over them, when the moon illuminates their dim waters, and when the white lotus opens which was shut over the bees, you would think them the face of a beautiful woman, who looks with a black eye from a white eyeball.

V. 12.—When a stream of the torrents of Varshakâla has flown to them with serpents, poison, and the impurities, the rising of Suhail above them cleans them from defilement and saves them from injury.
V. 13.—As one moment's thinking of Suhail before the door of a man blots out his sins deserving of punish-
ment, how much more effective will be the fluency of
the tongue praising him, when the task is to do away
with sin and to acquire heavenly reward! The former
Rishis have mentioned what sacrifice is necessary when
Suhail rises. I shall make a present to the kings by
relating it, and shall make this relation a sacrifice unto
Him. So I say:

V. 14.—His rising takes place at the moment when
some of the light of the sun appears from the east, and
the darkness of night is gathered in the west. The
beginning of his appearance is difficult to perceive, and
not every one who looks at him understands it. There-
fore ask the astronomer at that moment about the direc-
tion whence it rises.

V. 15, 16.—Towards this direction offer the sacrifice
called argha, and spread on the earth what you hap-
pen to have, roses and fragrant flowers as they grow
in the country. Put on them what you think fit, gold,
garments, jewels of the sea, and offer incense, saffron,
and sandalwood, musk and camphor, together
with an ox and a cow, and many dishes and sweet-
meats.

V. 17.—Know that he who does this during seven
consecutive years with pious intention, strong belief,
and confidence, possesses at the end of them the whole
earth and the ocean which surrounds it on the four
sides, if he is a Kshatriya.

V. 18.—If he is a Brahman, he obtains his wishes,
learns the Veda, obtains a beautiful wife, and gets
noble children from her. If he is a Vaiśya, he obtains
much landed property and acquires a glorious lordship.
If he is a Śūdra, he will obtain wealth. All of them
obtain health and safety, the cessation of injuries, and
the realisation of reward.”

This is Varāhamihira's statement regarding the offering
to Suhail. In the same book he gives also the rules regarding Rohiṅṭi:

"Garga, Vasishṭha, Kāśyapa, and Pāṇḍara told their pupils that Mount Mera is built of planks of gold. Out of them there have risen trees with numerous sweet-swelling flowers and blossoms. The bees already surround them with a humming pleasant to hear, and the nymphs of the Devas wander there to and fro with exhilarating melodies, with pleasant instruments and everlasting joy. This mountain lies in the plain Nandana, the park of paradise. So they say. Jupiter was there at a time, and then Nārada the Rishi asked him regarding the prognostics of Rohiṅṭi, upon which Jupiter explained them to him. I shall here relate them as far as necessary.

V. 4.—Let a man in the black days of the month Āshāḍha observe if the moon reaches Rohiṅṭi. Let him seek to the north or east of the town a high spot. To this spot the Brahman must go who has the charge of the houses of the kings. He is to light there a fire and to draw a diagram of the various planets and lunar stations round it. He is to recite what is necessary for each one of them, and to give each its share of the roses, barley, and oil, and to make each planet propitious by throwing these things into the fire. Round the fire on all four sides there must be as much as possible of jewels and jugs filled with the sweetest water, and whatever else there happens to be at hand at the moment, fruits, drugs, branches of trees, and roots of plants. Further, he is to spread there grass which is cut with a sickle for his night-quarters. Then he is to take the different kinds of seeds and corns, to wash them with water, to put gold in the midst of them, and to deposit them in a jug. He is to place it towards a certain direction, and to prepare Homa, i.e. throwing barley and oil into the fire, at the same time reciting certain passages from the Veda, which refer to

He raises a danda, i.e. a long and high spear, from the top of which hang down two straps, the one as long as the spear, the other thrice as long. He must do all this before the moon reaches Rohini, for this purpose, that when she reaches it, he should be ready to determine the times of the blowing of the wind as well as its directions. He learns this by means of the straps of the spear.

V. 10.—If the wind on that day blows from the centres of the four directions, it is considered propitious; if it blows from the directions between them, it is considered unlucky. If the wind remains steady in the same direction, powerful and without changing, this too is considered propitious. The time of its blowing is measured by the eight parts of the day, and each eighth part is considered as corresponding to the half of a month.

V. 11.—When the moon leaves the station Rohini, you look at the seeds placed in a certain direction. That of them which sprouts will grow plentifully in that year.

V. 12.—When the moon comes near Rohini, you must be on the look-out. If the sky is clear, not affected by any disturbance; if the wind is pure and does not cause a destructive commotion; if the melodies of the animals and birds are pleasant, this is considered propitious. We shall now consider the clouds.

V. 13, 14.—If they float like the branches of the valley (śatās?), and out of them the flashes of lightning appear to the eye; if they open as opens the white lotus; if the lightning encircles the cloud like the rays of the sun; if the cloud has the colour of stibium, or of bees, or of saffron;

V. 15–19.—If the sky is covered with clouds, and out of them flashes the lightning like gold, if the rain-
bow shows its round form coloured with something like the red of evening twilight, and with colours like those of the garments of a bride; if the thunder roars like the screaming peacock, or the bird which cannot drink water except from falling rain, which then screams for joy, as the frogs enjoy the full water-places, so as to croak vehemently; if you see the sky raging like the raging of elephants and buffaloes in the thicket, in the various parts of which the fire is blazing; if the clouds move like the limbs of the elephants, if they shine like the shining of pearls, conch-shells, snow, and even as the moonbeams, as though the moon had lent the clouds her lustre and splendour;

V. 20.—All this indicates much rain and blessing by a rich growth.

V. 25.—At the time when the Brahman sits amidst the water-jugs, the falling of stars, the flashing of the lightning, thunderbolts, red glow in the sky, tornado, earthquake, the falling of hail, and the screaming of the wild animals, all these things are considered as unlucky.

V. 26.—If the water decreases in a jug on the north side, either by itself, or by a hole, or by dripping away, there will be no rain in the month Śrāvaṇa. If it decreases in a jug on the east side, there will be no rain in Bhādrapada. If it decreases in a jug on the south side, there will be no rain in Āśvayuja; and if it decreases in a jug on the west side, there will be no rain in Kārttika. If there is no decrease of water in the jugs, the summer rain will be perfect.

V. 27.—From the jugs they also derive prognostics as to the different castes. The northern jug refers to the Brahman, the eastern to the Kshatriya, the southern to the Vaiśya, and the western to the Śudra. If the names of people and certain circumstances are inscribed upon the jugs, all that happens to them if, e.g. they break or the water in them decreases, is considered as
prognosticating something which concerns those persons or circumstances."

"The rules relating to the stations Svâti and Śravana are similar to those relating to Rohitā. When you are in the white days of the month Ashâdhâ, when the moon stands in either of the two stations Ashâdhâ, i.e. Pûrva-ashâdhâ or Uttara-ashâdhâ, select a spot as you have selected it for Rohitā, and take a balance of gold. That is the best. If it is of silver, it is middling. If it is not of silver, make it of wood called khâyar, which seems to be the khadira tree (i.e. Acacia catechu), or of the head of an arrow with which already a man has been killed. The smallest measure for the length of its beam is a span. The longer it is, the better; the shorter it is, the less favourable.

V. 6.—A scale has four strings, each 10 digits long. Its two scales are of linen cloth of the size of 6 digits. Its two weights are of gold.

V. 7, 8.—Weigh by it equal quantities of each matter, water of the wells, of the ponds, and of the rivers, elephants' teeth, the hair of horses, pieces of gold with the names of kings written on them, and pieces of other metal over which the names of other people, or the names of animals, years, days, directions, or countries have been pronounced.

V. 1.—In weighing, turn towards the east; put the weight in the right scale, and the things which are to be weighed in the left. Recite over them and speak to the balance:

V. 2.—'Thou art correct; thou art Deva, and the wife of a Deva. Thou art Sarasvati, the daughter of Brahman. Thou revealest the right and the truth. Thou art more correct than the soul of correctness.

V. 3.—Thou art like the sun and the planets in their wandering from east to west on one and the same road.

V. 4.—Through thee stands upright the order of the
world, and in thee is united the truth and the correctness of all the angels and Brahmanas.

V. 5.—Thou art the daughter of Brahman, and a man of thy house is Kasyapa.'

V. 1.—This weighing must take place in the evening. Then put the things aside, and repeat their weighing the next morning. That which has increased in weight will flourish and thrive in that year; that which has decreased will be bad and go back.

This weighing, however, is not only to be done in Ashadhā, but also in Rohini and Svātṛ.

V. 11.—If the year is a leap-year, and the weighing happens to take place in the repeated month, the weighing is in that year twice done.

V. 12.—If the prognostics are identical, what they forebode will happen. If they were not identical, observe the prognostics of Rohini, for it is predominant."
CHAPTER LVIII.

HOW EBB AND FLOW FOLLOW EACH OTHER IN THE OCEAN.

With regard to the cause why the water of the ocean always remains as it is, we quote the following passage from the *Matsya-Purāṇa*:—"At the beginning there were sixteen mountains, which had wings and could fly and rise up into the air. However, the rays of Indra, the ruler, burned their wings, so that they fell down, deprived of them, somewhere about the ocean, four of them in each point of the compass—in the east, Rishabhā, Balāhaka, Cakra, Maināka; in the north, Candra, Kanika, Drona, Suhma; in the west, Vakra, Vadhra, Nārada, Parvata; in the south, Jīmūta, Dravīṇa, Maināka, Mahāśaila (?). Between the third and the fourth of the eastern mountains there is the fire *Samvartaka*, which drinks the water of the ocean. But for this the ocean would fill up, since the rivers perpetually flow to it.

"This fire was the fire of one of their kings, called *Aurva*. He had inherited the realm from his father, who was killed while he was still an embryo. When he was born and grew up, and heard the history of his father, he became angry against the angels, and drew his sword to kill them, since they had neglected the guardianship of the world, notwithstanding mankind's worshipping them and notwithstanding their being in close contact with the world. Thereupon the angels humiliated themselves before him and tried to con-
ciliate him, so that he ceased from his wrath. Then he spoke to them: 'But what am I to do with the fire of my wrath?' and they advised him to throw it into the ocean. It is this fire which absorbs the waters of the ocean. Others say: 'The water of the streams does not increase the ocean, because Indra, the ruler, takes up the ocean in the shape of the cloud, and sends it down as rains.'"

Again the Matsya-Purāṇa says: "The black part in the moon which is called Śaśalaksha, i.e. the hare's figure, is the image of the figures of the above-mentioned sixteen mountains reflected by the light of the moon on her body."

The Vishnū-Dharma says: "The moon is called Śaśa-
laksha, for the globe of her body is watery, reflecting the figure of the earth as a mirror reflects. On the earth there are mountains and trees of different shapes, which are reflected in the moon as a hare's figure. It is also called Mrigalācanā, i.e. the figure of a gazelle, for certain people compare the black part on the moon's face to the figure of a gazelle."

The lunar stations they declare to be the daughters of Prajāpati, to whom the moon is married. He was especially attached to Rohini, and preferred her to the others. Now her sisters, urged by jealousy, complained of him to their father Prajāpati. The latter strove to keep peace among them, and admonished him, but without any success. Then he cursed the moon (Lunus), in consequence of which his face became leprous. Now the moon repented of his doing, and came penitent to Prajāpati, who spoke to him: "My word is one, and cannot be cancelled; however, I shall cover thy shame for the half of each month." Thereupon the moon spoke to Prajāpati: "But how shall the trace of the sin of the past be wiped off from me?" Prajāpati answered: "By erecting the shape of the linga of Mahādeva as an object of thy worship." This he did. The linga he
raised was the stone of Somanâth, for soma means the
moon and ndtha means master, so that the whole word
means master of the moon. The image was destroyed
by the Prince Mahmud — may God be merciful to
him! — A.H. 416. He ordered the upper part to be
broken and the remainder to be transported to his resi-
dence, Ghaznîn, with all its coverings and trappings of
gold, jewels, and embroidered garments. Part of it
has been thrown into the hippodrome of the town,
together with the Cakrasvâmin, an idol of bronze, that
had been brought from Tâneshar. Another part of the
idol from Somanâth lies before the door of the mosque
of Ghaznîn, on which people rub their feet to clean
them from dirt and wet.

The linga is an image of the penis of Mahâdeva. I
have heard the following story regarding it: — "A Rishi,
on seeing Mahâdeva with his wife, became suspicious
of him, and cursed him that he should lose his penis.
At once his penis dropped, and was as if wiped
off. But afterwards the Rishi was in a position to
establish the signs of his innocence and to confirm
them by the necessary proofs. The suspicion which
had troubled his mind was removed, and he spoke to
him: ‘Verily, I shall recompense thee by making the
image of the limb which thou hast lost the object of
worship for men, who thereby will find the road to God,
and come near him.’"

Varâhamihira says about the construction of the
linga: "After having chosen a faultless stone for it,
take it as long as the image is intended to be. Divide
it into three parts. The lowest part of it is quad-
rangular, as if it were a cube or quadrangular column.
The middle part is octagonal, its surface being divided
by four pilasters. The upper third is round, rounded
off so as to resemble the gland of a penis.

V. 54.—In erecting the figure, place the quadrang-
lar third within the earth, and for the octagonal third
make a cover, which is called pinda, quadrangular from without, but so as to fit also on the quadrangular third in the earth. The octagonal form of the inner side is to fit on to the middle third, which projects out of the earth. The round third alone remains without cover."

Further he says:—

V. 55.—"If you make the round part too small or too thin, it will hurt the country and bring about evil among the inhabitants of the regions who have constructed it. If it does not go deep enough down into the earth, or if it projects too little out of the earth, this causes people to fall ill. When it is in the course of construction, and is struck by a peg, the ruler and his family will perish. If on the transport it is hit, and the blow leaves a trace on it, the artist will perish, and destruction and diseases will spread in that country."

In the south-west of the Sindh country this idol is frequently met with in the houses destined for the worship of the Hindus, but Somanath was the most famous of these places. Every day they brought there a jug of Ganges water and a basket of flowers from Kashmir. They believed that the linga of Somanath would cure persons of every inveterate illness and heal every desperate and incurable disease.

The reason why in particular Somanath has become so famous is that it was a harbour for seafaring people, and a station for those who went to and fro between Sufala in the country of the Zanj and China.

Now as regards ebb and flow in the Indian Ocean, of which the former is called bharana (?), the latter vuhara (?), we state that, according to the notions of the common Hindus, there is a fire called Vadjavatnala in the ocean, which is always blazing. The flow is caused by the fire’s drawing breath and its being blown up by the wind, and the ebb is caused by the fire’s exhaling
the breath and the cessation of its being blown up by
the wind.

Māṇi has come to a belief like this, after he had
heard from the Hindus that there is a demon in the
sea whose drawing breath and exhaling breath causes
the flow and the ebb.

The educated Hindus determine the daily phases of
the tides by the rising and setting of the moon, the
monthly phases by the increase and waning of the
moon; but the physical cause of both phenomena is not
understood by them.

It is flow and ebb to which Somanāth owes its name
(i.e. master of the moon); for the stone (or liṅga) of
Somanāth was originally erected on the coast, a little
less than three miles west of the mouth of the river
Sarsuti, east of the golden fortress Bārōi, which had
appeared as a dwelling-place for Vāsudeva, not far from
the place where he and his family were killed, and
where they were burned. Each time when the moon
rises and sets, the water of the ocean rises in the flood
so as to cover the place in question. When, then, the
moon reaches the meridian of noon and midnight, the
water recedes in the ebb, and the place becomes again
visible. Thus the moon was perpetually occupied in
serving the idol and bathing it. Therefore the place
was considered as sacred to the moon. The fortress
which contained the idol and its treasures was not
ancient, but was built only about a hundred years ago.

The Vishṇu-Purāṇa says: “The greatest height of
the water of the flow is 1500 digits.” This statement
seems rather exaggerated; for if the waves and the
mean height of the ocean rose to between sixty to
seventy yards, the shores and the bays would be more
overflown than has ever been witnessed. Still this is
not entirely improbable, as it is not in itself impossible
on account of some law of nature.

The fact that the just-mentioned fortress is said to
have appeared out of the ocean is not astonishing for that particular part of the ocean; for the Dibajāt islands (Maledives and Laccadives) originate in a similar manner, rising out of the ocean as sand-downs. They increase, and rise, and extend themselves, and remain in this condition for a certain time. Then they become decrepit as if from old age; the single parts become dissolved, no longer keep together, and disappear in the water as if melting away. The inhabitants of the islands quit that one which apparently dies away, and migrate to a young and fresh one which is about to rise above the ocean. They take their cocoanut palms along with them, colonise the new island, and dwell on it.

That the fortress in question is called golden may only be a conventional epithet. Possibly, however, this object is to be taken literally, for the islands of the Zabaj are called the Gold Country (Swarnadotpa), because you obtain much gold as deposit if you wash only a little of the earth of that country.
CHAPTER LIX.

ON THE SOLAR AND LUNAR ECLIPSES.

It is perfectly known to the Hindu astronomers that the moon is eclipsed by the shadow of the earth, and the sun is eclipsed by the moon. Hereon they have based their computations in the astronomical handbooks and other works.

Varahamihira says in the *Sanhitā*:

V. 1.—“Some scholars maintain that the Head belonged to the Daityas, and that his mother was Simhikā. After the angels had fetched the *amrīta* out of the ocean, they asked Vishnu to distribute it among them. When he did so, the Head also came, resembling the angels in shape, and associated himself with them. When Vishnu handed him a portion of the *amrīta*, he took and drank it. But then Vishnu perceived who it was, hit him with his round *cekrā*, and cut off his head. However, the head remained alive on account of the *amrīta* in its mouth, whilst the body died, since it had not yet partaken of the *amrīta*, and the force of the latter had not yet spread through it. Then the Head, humbling itself, spoke: ‘For what sin has this been done?’ Thereupon he was recompensed by being raised to heaven and by being made one of its inhabitants.

V. 2.—Others say that the Head has a body like sun and moon, but that it is black and dark, and cannot therefore be seen in heaven. Brahman, the first father,
ordered that he should never appear in heaven except at the time of an eclipse.

V. 3.—Others say that he has a head like that of a serpent, and a tail like that of a serpent, whilst others say that he has no other body besides the black colour which is seen.”

After having finished the relation of these absurdities, Varahamihira continues:—

V. 4.—“If the Head had a body, it would act by immediate contact, whilst we find that he eclipses from a distance, when between him and the moon there is an interval of six zodiacal signs. Besides, his motion does not increase nor decrease, so that we cannot imagine an eclipse to be caused by his body reaching the spot of the lunar eclipse.

V. 5.—And if a man commits himself to such a view, let him tell us for what purpose the cycles of the Head’s rotation have been calculated, and what is the use of their being correct in consequence of the fact that his rotation is a regular one. If the Head is imagined to be a serpent with head and tail, why does it not eclipse from a distance less or more than six zodiacal signs?

V. 6.—His body is there present between head and tail; both hang together by means of the body. Still it does not eclipse sun nor moon nor the fixed stars of the lunar stations, there being an eclipse only if there are two heads opposed to each other.

V. 7.—If the latter were the case, and the moon rose, being eclipsed by one of the two, the sun would necessarily set, being eclipsed by the other. Likewise, if the moon should set eclipsed, the sun would rise eclipsed. And nothing of the kind ever occurs.

V. 8.—As has been mentioned by scholars who enjoy the help of God, an eclipse of the moon is her entering the shadow of the earth, and an eclipse of the sun consists in this that the moon covers and hides the sun
from us. Therefore the lunar eclipse will never revolve from the west nor the solar eclipse from the east.

V. 9.—A long shadow stretches away from the earth, in like manner as the shadow of a tree.

V. 10.—When the moon has only little latitude, standing in the seventh sign of its distance from the sun, and if it does not stand too far north or south, in that case the moon enters the shadow of the earth and is eclipsed thereby. The first contact takes place on the side of the east.

V. 11.—When the sun is reached by the moon from the west, the moon covers the sun, as if a portion of a cloud covered him. The amount of the covering differs in different regions.

V. 12.—Because that which covers the moon is large, her light wanes when one-half of it is eclipsed; and because that which covers the sun is not large, the rays are powerful notwithstanding the eclipse.

V. 13.—The nature of the Head has nothing whatever to do with the lunar and solar eclipses. On this subject the scholars in their books agree."

After having described the nature of the two eclipses, as he understands them, he complains of those who do not know this, and says: "However, common people are always very loud in proclaiming the Head to be the cause of an eclipse, and they say, 'If the Head did not appear and did not bring about the eclipse, the Brahmans would not at that moment undergo an obligatory washing.'"

Vardhamihira says:—

V. 14.—"The reason of this is that the head humiliated itself after it had been cut off, and received from Brahman a portion of the offering which the Brahmans offer to the fire at the moment of an eclipse.

V. 15.—Therefore he is near the spot of the eclipse, searching for his portion. Therefore at that time people mention him frequently, and consider him as the cause
of the eclipse, although he has nothing whatsoever to
do with it; for the eclipse depends entirely upon the
uniformity and the declination of the orbit of the
moon."

The latter words of Varāhamihira, who, in passages
quoted previously, has already revealed himself to us
as a man who accurately knows the shape of the world,
are odd and surprising. However, he seems sometimes
to side with the Brahmans, to whom he belonged, and
from whom he could not separate himself. Still he
does not deserve to be blamed, as, on the whole, his
foot stands firmly on the basis of the truth, and he
clearly speaks out the truth. Compare, e.g. his state-
ment regarding the Samhīdrī, which we have mentioned
above (v. i. 366).

Would to God that all distinguished men followed
his example! But look, for instance, at Brahmagupta,
who is certainly the most distinguished of their astro-
nomers. For as he was one of the Brahmans who read
in their Purāṇas that the sun is lower than the moon,
and who therefore require a head biting the sun in
order that he should be eclipsed, he shirks the truth
and lends his support to imposture, if he did not—and
this we think by no means impossible—from intense
disgust at them, speak as he spoke simply in order to
mock them, or under the compulsion of some mental
derangement, like a man whom death is about to rob of
his consciousness. The words in question are found in
the first chapter of his Brahmasiddhānta:

"Some people think that the eclipse is not caused by
the Head. This, however, is a foolish idea, for it is he
in fact who eclipses, and the generality of the inhab-
tants of the world say that it is the Head who eclipses.
The Veda, which is the word of God from the mouth of
Brahman, says that the Head eclipses, likewise the book
Smṛiti, composed by Manu, and the Samhīd, composed
by Garga the son of Brahman. On the contrary, Varā-
hamihira, Śrīśeṅa, Āryabhaṭa, and Viśnucandra maintain that the eclipse is not caused by the Head, but by the moon and the shadow of the earth, in direct opposition to all (to the generality of men), and from enmity against the just-mentioned dogma. For if the Head does not cause the eclipse, all the usages of the Brahmans which they practise at the moment of an eclipse, viz. their rubbing themselves with warm oil, and other works of prescribed worship, would be illusory and not be rewarded by heavenly bliss. If a man declares these things to be illusory, he stands outside of the generally acknowledged dogma, and that is not allowed. Manu says in the Smṛiti: ‘When the Head keeps the sun or moon in eclipse, all waters on earth become pure, and in purity like the water of the Ganges.’ The Veda says: ‘The Head is the son of a woman of the daughters of the Daityas, called Saṁakāt (Saṁhikāt). Therefore people practise the well-known works of piety, and therefore those authors must cease to oppose the generality, for everything which is in the Veda, Smṛiti, and Saṁhitā is true.’

If Brahmagupta, in this respect, is one of those of whom God says (Koran, Sūra xxvii. 14), ‘They have denied our signs, although their hearts knew them clearly, from wickedness and haughtiness,’ we shall not argue with him, but only whisper into his ear: If people must under circumstances give up opposing the religious codes (as seems to be your case), why then do you order people to be pious if you forget to be so yourself? Why do you, after having spoken such words, then begin to calculate the diameter of the moon in order to explain her eclipsing the sun, and the diameter of the shadow of the earth in order to explain its eclipsing the moon? Why do you compute both eclipses in agreement with the theory of those heretics, and not according to the views of those with whom you think it proper to agree? If the Brahmans are ordered to
practise some act of worship or something else at the occurrence of an eclipse, the eclipse is only the date of these things, not their cause. Thus we Muslims are bound to say certain prayers, and prohibited from saying others, at certain times of the revolution of the sun and his light. These things are simply chronological dates for those acts, nothing more, for the sun has nothing whatever to do with our (Muslim) worship.

Brahmagupta says (ii. 110), "The generality thinks thus." If he thereby means the totality of the inhabitants of the habitable world, we can only say that he would be very little able to investigate their opinions either by exact research or by means of historical tradition. For India itself is, in comparison to the whole habitable world, only a small matter, and the number of those who differ from the Hindus, both in religion and law, is larger than the number of those who agree with them.

Or if Brahmagupta means the generality of the Hindus, we agree that the uneducated among them are much more numerous than the educated; but we also point out that in all our religious codes of divine revelation the uneducated crowd is blamed as being ignorant, always doubting, and ungrateful.

I, for my part, am inclined to the belief that that which made Brahmagupta speak the above-mentioned words (which involve a sin against conscience) was something of a calamitous fate, like that of Socrates, which had befallen him, notwithstanding the abundance of his knowledge and the sharpness of his intellect, and notwithstanding his extreme youth at the time. For he wrote the Brahmasiddhānta when he was only thirty years of age. If this indeed is his excuse, we accept it, and herewith drop the matter.

As for the above-mentioned people (the Hindu theologians), from whom you must take care not to differ, how should they be able to understand the astronomical
theory regarding the moon's eclipsing the sun, as they, in their Purânas, place the moon above the sun, and that which is higher cannot cover that which is lower in the sight of those who stand lower than both. Therefore they required some being which devours moon and sun, as the fish devours the bait, and causes them to appear in those shapes in which the eclipsed parts of them in reality appear. However, in each nation there are ignorant people, and leaders still more ignorant than they themselves, who (as the Koran, Sura xxix. 12, says) "bear their own burdens and other burdens besides them," and who think they can increase the light of their minds; the fact being that the masters are as ignorant as the pupils.

Very odd is that which Varahamihira relates of certain ancient writers, to whom we must pay no attention if we do not want to oppose them, viz. that they tried to prognosticate the occurrence of an eclipse by pouring a small amount of water together with the same amount of oil into a large vase with a flat bottom on the eighth of the lunar days. Then they examined the spots where the oil was united and dispersed. The united portion they considered as a prognostication for the beginning of the eclipse, the dispersed portion as a prognostication for its end.

Further, Varahamihira says that somebody used to think that the conjunction of the planets is the cause of the eclipse (V. 16), whilst others tried to prognosticate an eclipse from unlucky phenomena, as, e.g. the falling of stars, comets, halo, darkness, hurricane, landslip, and earthquake. "These things," so he says, "are not always contemporary with an eclipse, nor are they its cause; the nature of an unlucky event is the only thing which these occurrences have in common with an eclipse. A reasonable explanation is totally different from such absurdities."

The same man, knowing only too well the character
of his countrymen, who like to mix up peas with wolf's beans, pears with dung, says, without quoting any authority for his words (V. 63): "If at the time of an eclipse a violent wind blows, the next eclipse will be six months later. If a star falls down, the next eclipse will be twelve months later. If the air is dusty, it will be eighteen months later. If there is an earthquake, it will be twenty-four months later. If the air is dark, it will be thirty months later. If hail falls, it will be thirty-six months later."

To such things silence is the only proper answer.

I shall not omit to mention that the different kinds of eclipses described in the canon of Alkhwārizmī, though correctly represented, do not agree with the results of actual observation. More correct is a similar view of the Hindus, viz. that the eclipse has the colour of smoke if it covers less than half the body of the moon; that it is coal-black if it completely covers one half of her; that it has a colour between black and red if the eclipse covers more than half of her body; and, lastly, that it is yellow-brown if it covers the whole body of the moon.
CHAPTER LX.

ON THE PARVAN.

The intervals between which an eclipse may happen and the number of their lunations are sufficiently demonstrated in the sixth chapter of Almagest. The Hindus call a period of time at the beginning and end of which there occur lunar eclipses, parvan. The following information on the subject is taken from the Samhita. Its author, Varahamihira, says: "Each six months form a parvan, in which an eclipse may happen. These eclipses form a cycle of seven, each of which has a particular dominant and prognostics, as exhibited in the following table:

<table>
<thead>
<tr>
<th>Number of the Parvan</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominants of the Parvan</td>
<td>Brahman</td>
<td>Sūtra, i.e. the Moon</td>
<td>Indra, the Ruler</td>
<td>Kubera, the Protector of the North</td>
<td>Varuna, the Protector of the Water</td>
<td>Agni, the Fire, also called Mitra-khya</td>
<td>Yama, the Angel of Death</td>
</tr>
<tr>
<td>Their Prognostics</td>
<td>Favourable to the Brahman; the cattle is thriving, the crops growing, general well-being and prosperity.</td>
<td>The same as in the first Parvan but rain in excess.</td>
<td>The kings become estranged from each other, safety declines, and the autumnal crops are ruined.</td>
<td>There is abundance and wealth; rich people rule their provinces.</td>
<td>Not favourable to kings, but favourable to others; the crops are flourishing.</td>
<td>There is much water, the crops general well-being and prosperity are declining.</td>
<td>Rain is scarce; the crops perish, and thus famine follows.</td>
</tr>
</tbody>
</table>

Page 256.
Explanation of the term parvan.
Quotation from Varahamihira's Samhitā, chap. v. 19-23.
The computation of the parvan in which you happen to be is the following, according to the Khandakādhyāyaka: "Write down the ahargana, as computed according to this canon, in two places. Multiply the one by 50, and divide the product by 1296, reckoning a fraction, if it is not less than one-half, as a whole. Add to the quotient 1063. Add the sum to the number written in the second place, and divide the sum by 180. The quotient, as consisting of wholes, means the number of complete parvans. Divide it by 7, and the remainder under 7 which you get means the distance of the particular parvan from the first one, i.e. from that of Brahman. However, the remainder under 180 which you get by the division is the elapsed part of the parvan in which you are. You subtract it from 180. If the remainder is less than 15, a lunar eclipse is possible or necessary; if the remainder is larger, it is impossible. Therefore you must always by a similar method compute that time which has elapsed before the particular parvan in which you happen to be."

In another passage of the book we find the following rule: "Take the kalpa-ahargana, i.e. the past portion of the days of a kalpa. Subtract therefrom 96,031, and write down the remainder in two different places. Subtract from the lower number 84, and divide the sum by 561. Subtract the quotient from the upper number and divide the remainder by 173. The quotient you disregard, but the remainder you divide by 7. The quotient gives parvans, beginning with Brahmadī" (sic).

These two methods do not agree with each other. We are under the impression that in the second passage something has either fallen out or been changed by the copyists.

What Varāhamihira says of the astrological portents of the parvans does not well suit his deep learning. He says: "If in a certain parvan there is no eclipse, but there is one in the other cycle, there are no rains,
and there will be much hunger and killing." If in this passage the translator has not made a blunder, we can only say that this description applies to each parvan preceding such a one in which there occurs an eclipse.

Stranger still is the following remark of his (V. 24): "If an eclipse occurs earlier than has been calculated, there is little rain and the sword is drawn. If it occurs later than has been calculated, there will be pestilence, and death, and destruction in the corn, the fruit, and flowers. (V. 25.) This is part of what I have found in the books of the ancients and transferred to this place. If a man properly knows how to calculate, it will not happen to him in his calculations that an eclipse falls too early or too late. If the sun is eclipsed and darkened outside a parvan, you must know that an angel called Tvashtri has eclipsed him."

Similar to this is what he says in another passage: "If the turning to the north takes place before the sun enters the sign Capricornus, the south and the west will be ruined. If the turning to the south takes place before the sun enters Cancer, the east and the north will be ruined. If the turning coincides with the sun's entering the first degrees of these two signs, or takes place after it, happiness will be common to all four sides, and bliss in them will increase."

Such sentences, understood as they seem intended to be understood, sound like the ravings of a madman, but perhaps there is an esoteric meaning concealed behind them which we do not know.

After this we must continue to speak of the domini temporum, for these too are of a cyclical nature, adding such materials as are related to them.
CHAPTER LXI.

ON THE DOMINANTS OF THE DIFFERENT MEASURES OF TIME IN BOTH RELIGIOUS AND ASTRONOMICAL RELATIONS, AND ON CONNECTED SUBJECTS.

Duration, or time in general, only applies to the Creator as being his age, and not determinable by a beginning and an end. In fact, it is his eternity. They frequently call it the soul, i.e. purusha. But as regards common time, which is determinable by motion, the single parts of it apply to beings beside the Creator, and to natural phenomena beside the soul. Thus kalpa is always used in relation to Brahman, for it is his day and night, and his life is determined by it.

Each manvantara has a special dominant called Manu, who is described by special qualities, already mentioned in a former chapter. On the other hand, I have never heard anything of dominants of the catur-yugas or yugas.

Varāhamihira says in the Great Book of Nativities: "Abda, i.e. the year, belongs to Saturn; Ayana, half a year, to the sun; Ritu, the sixth part of a year, to Mercury; the month, to Jupiter; Paksha, half a month, to Venus; Vīsara, the day, to Mars; Muhūrta, to the moon."

In the same book he defines the sixth parts of the year in the following manner: "The first, beginning with the winter solstice, belongs to Saturn; the second, to Venus; the third, to Mars; the fourth, to the Moon; the fifth, to Mercury; the sixth, to Jupiter."
CHAPTER LXI.

We have already, in former chapters, described the dominants of the hours, of the muhūrtas, of the halves of the lunar days, of the single days in the white and black halves of the month, of the parvans of the eclipses, and of the single manvantaras. What there is more of the same kind we shall give in this place.

In computing the dominant of the year, the Hindus use another method than the Western nations, who compute it, according to certain well-known rules, from the ascendens or horoscope of a year. The dominant of the year as well as the dominant of the month are the rulers of certain periodically recurring parts of time, and are by a certain calculation derived from the dominants of the hours and the dominants of the days.

If you want to find the dominant of the year, compute the sum of days of the date in question according to the rules of the canon Khandakādyaka, which is the most universally used among them. Subtract therefrom 2201, and divide the remainder by 360. Multiply the quotient by 3, and add to the product always 3. Divide the sum by 7. The remainder, a number under 7, you count off on the week-days, beginning with Sunday. The dominant of that day you come to is at the same time the dominant of the year. The remainders you get by the division are the days of his rule which have already elapsed. These, together with the days of his rule which have not yet elapsed, give the sum of 360.

It is the same whether we reckon as we have just explained, or add to the here-mentioned sum of days 319, instead of subtracting from it.

If you want to find the dominant of the month, subtract 71 from the sum of days of the date in question, and divide the remainder by 30. Double the quotient and add 1. The sum divide by 7, and the remainder count off on the week-days, beginning with Sunday. The dominant of the day you come to is at the same
time the dominant of the month. The remainder you get by the division is that part of his rule which has already elapsed. This, together with that part of his rule which has not yet elapsed, gives the sum of 30 days.

It is the same whether you reckon as we have just explained, or add 19 to the days of the date, instead of subtracting from them, and then add 2 instead of 1 to the double of the sum.

It is useless here to speak of the dominant of the day, for you find it by dividing the sum of the days of a date by 7; or to speak of the dominant of the hour, for you find it by dividing the revolving sphere by 15. Those, however, who use the śūtras āruputas divide by 15 the distance between the degree of the sun and the degree of the ascendant, it being measured by equal degrees.

The book Śrādhava of Mahādeva says: “Each of the thirds of the day and night has a dominant. The dominant of the first third of day and night is Brahman, that of the second Vishnu, and that of the third Rudra.” This division is based on the order of the three primeval forces (sātvā, rajās, tamās).

The Hindus have still another custom, viz. that of mentioning together with the dominant of the year one of the ṇḍgas or serpents, which have certain names as they are used in connection with one or other of the planets. We have united them in the following table:

<table>
<thead>
<tr>
<th>Table of the serpents.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The dominant of the year.</td>
</tr>
<tr>
<td>Sun.</td>
</tr>
<tr>
<td>Moon.</td>
</tr>
<tr>
<td>Mars.</td>
</tr>
<tr>
<td>Mercury.</td>
</tr>
<tr>
<td>Jupiter.</td>
</tr>
<tr>
<td>Venus.</td>
</tr>
<tr>
<td>Saturn.</td>
</tr>
</tbody>
</table>
CHAPTER LXI.

The Hindus combine the planets with the sun because they depend upon the sun, and the fixed stars with the moon because the stars of her stations belong to them. It is known among Hindu as well as Muslim astrologers that the planets exercise the rule over the zodiacal signs. Therefore they assume certain angelic beings as the dominants of the planets, who are exhibited in the following table, taken from the *Vishnu-dharma*:

<table>
<thead>
<tr>
<th>The planets and the two nodes</th>
<th>Their dominants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>Agni.</td>
</tr>
<tr>
<td>Moon</td>
<td>Vyāna (?)</td>
</tr>
<tr>
<td>Mars</td>
<td>Kālmāsha (?)</td>
</tr>
<tr>
<td>Mercury</td>
<td>Vishnu.</td>
</tr>
<tr>
<td>Jupiter</td>
<td>Sukra.</td>
</tr>
<tr>
<td>Venus</td>
<td>Gaurī.</td>
</tr>
<tr>
<td>Saturn</td>
<td>Prajāpati.</td>
</tr>
<tr>
<td>The Head</td>
<td>Gaṇapati (?)</td>
</tr>
<tr>
<td>The Tail</td>
<td>Viśvakarman.</td>
</tr>
</tbody>
</table>

The same book attributes also to the lunar stations as to the planets certain dominants, who are contained in the following table:

<table>
<thead>
<tr>
<th>The Lunar Stations</th>
<th>Their dominants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krittika.</td>
<td>Agni.</td>
</tr>
<tr>
<td>Rohitā</td>
<td>Kāśvara.</td>
</tr>
<tr>
<td>Mrigāśirsha.</td>
<td>Indu, i.e. the moon.</td>
</tr>
<tr>
<td>Ādṛtā</td>
<td>Rudra.</td>
</tr>
<tr>
<td>Punarvasu.</td>
<td>Aditī.</td>
</tr>
<tr>
<td>Pushya.</td>
<td>Gaṇu, i.e. Jupiter.</td>
</tr>
<tr>
<td>Āśleha.</td>
<td>Sarpa.</td>
</tr>
<tr>
<td>Magha.</td>
<td>Pītara.</td>
</tr>
<tr>
<td>Pārvapadgunt.</td>
<td>Bhaga.</td>
</tr>
<tr>
<td>Uttarapadgunt.</td>
<td>Aryaman.</td>
</tr>
<tr>
<td>Hasta.</td>
<td>Savitṛi, i.e. Savitā.</td>
</tr>
<tr>
<td>Citrā.</td>
<td>Trashtṛi.</td>
</tr>
<tr>
<td>Svātt.</td>
<td>Vāyu.</td>
</tr>
<tr>
<td>Viśākha.</td>
<td>Indrāṅg.</td>
</tr>
<tr>
<td>The Lunar Stations</td>
<td>Their Dominants</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Anurādhā.</td>
<td>Mitra.</td>
</tr>
<tr>
<td>Jyeṣṭhā.</td>
<td>Śakra.</td>
</tr>
<tr>
<td>Māla.</td>
<td>Nirūtī.</td>
</tr>
<tr>
<td>Pārvāshādhā.</td>
<td>Āpasa.</td>
</tr>
<tr>
<td>Uttarāśādhā.</td>
<td>Viṣvē[deva].</td>
</tr>
<tr>
<td>Abhijit.</td>
<td>Brahman.</td>
</tr>
<tr>
<td>Śravaca.</td>
<td>Viṣṇu.</td>
</tr>
<tr>
<td>Dhanishtā.</td>
<td>Vasāvas.</td>
</tr>
<tr>
<td>Satabhishaj.</td>
<td>Varuna.</td>
</tr>
<tr>
<td>Pārvavahādrapadā.</td>
<td>[Aja ekapād].</td>
</tr>
<tr>
<td>Uttarabhādrapadā.</td>
<td>Aḥir budhnya.</td>
</tr>
<tr>
<td>Revaṭi.</td>
<td>Pēshan.</td>
</tr>
<tr>
<td>Aśvinī.</td>
<td>Aśvin (?)</td>
</tr>
<tr>
<td>Bharadī.</td>
<td>Yama.</td>
</tr>
</tbody>
</table>
CHAPTER LXII.

ON THE SIXTY YEARS-SAMVATSARA, ALSO CALLED "SHASHTYABDA."

The word samvatsara, which means the years, is a technical term for cycles of years constructed on the basis of the revolutions of Jupiter and the sun, the heliacal rising of the former being reckoned as the beginning. It revolves in sixty years, and is therefore called shashtyabda, i.e. sixty years.

We have already mentioned that the names of the lunar stations are, by the names of the months, divided into groups, each month having a namesake in the corresponding group of stations. We have represented these things in a table, in order to facilitate the subject (v. i. 218). Knowing the station in which the heliacal rising of Jupiter occurs, and looking up this station in the just-mentioned table, you find at the left of it the name of the month which rules over the year in question. You bring the year in connection with the month, and say, e.g. the year of Caitra, the year of Vaishakha, &c. For each of these years there exist astrological rules which are well known in their literature.

For the computation of the lunar station in which the heliacal rising of Jupiter occurs, Varāhamihira gives the following rule in his Samhitā:

"Take the Śakakāla, multiply it by 11, and multiply the product by 4. You may do this, or you may also multiply the Śakakāla by 44. Add 8589 to the product.
and divide the sum by 3750. The quotient represents years, months, days, &c.

"Add them to the Śakakśa, and divide the sum by 60. The quotient represents great sexagenarian yugas, i.e. complete śaśādyabdas, which, as not being necessary, are disregarded. Divide the remainder by 5, and the quotient represents small, complete five-year yugas. That which remains being less than one yuga, is called saṃvatsara, i.e. the year.

"V. 22.—Write down the latter number in two different places. Multiply the one by 9, and add to the product $\frac{1}{3}$ of the number in the other place. Take of the sum the fourth part, and this number represents complete lunar stations, its fractions representing part of the next following current station. Count off this number of the stations, beginning with Dhanishtḥā. The station you arrive at is that one in which the heliacal rising of Jupiter takes place." Thereby you know the month of the years, as has above been explained.

The great yugas begin with the heliacal rising of Jupiter in the beginning of the station Dhanishtḥā and the beginning of the month Māgha. The small yugas have within the great ones a certain order, being divided into groups which comprehend certain numbers of years, and each of which has a special dominant. This division is represented by the following table.

If you know what number in the great yuga the year in question occupies, and you look up this number among the numbers of the years in the upper part of the table, you find under it, in the corresponding columns, both the name of the year and the name of its dominant.
<table>
<thead>
<tr>
<th>Number of the cycle</th>
<th>Numbers with the unit 1.</th>
<th>Numbers with the unit 6.</th>
<th>Numbers with the unit 7.</th>
<th>Numbers with the unit 8.</th>
<th>Numbers with the unit 4.</th>
<th>Numbers with the unit 9.</th>
<th>Numbers with the unit 5.</th>
<th>Numbers without a unit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>12</td>
<td>17</td>
<td>13</td>
<td>18</td>
<td>14</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>16</td>
<td>22</td>
<td>27</td>
<td>23</td>
<td>28</td>
<td>24</td>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>21</td>
<td>26</td>
<td>32</td>
<td>37</td>
<td>33</td>
<td>38</td>
<td>34</td>
<td>39</td>
<td>35</td>
</tr>
<tr>
<td>31</td>
<td>36</td>
<td>42</td>
<td>47</td>
<td>43</td>
<td>48</td>
<td>44</td>
<td>49</td>
<td>45</td>
</tr>
<tr>
<td>41</td>
<td>46</td>
<td>52</td>
<td>57</td>
<td>53</td>
<td>58</td>
<td>54</td>
<td>59</td>
<td>55</td>
</tr>
<tr>
<td>51</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The names which each dozen of years has in common:

- **Samvatsara.**
- **Parivatsara.**
- **Idāvatsara.**
- **Anuvatsara.**
- **Udvatsara.**

Their dominants:

- **Agni,** i.e. the fire.
- **Arka,** i.e. the sun.
- Śītāmayākkhāmālin, i.e. having a cold ray, viz. the moon.
- Prajāpati, the father of the lunar stations.
- Śailasutāpati, i.e. the husband of the daughter of the mountain, viz. Mahādeva.
Further, every single one of the sixty years has a name of its own, and the yugas, too, have names which are the names of their dominants. All these names are exhibited in the following table.

This table is to be used in the same way as the preceding one, as you find the name of each year of the whole cycle (of sixty years) under the corresponding number. It would be a lengthy affair if we were to explain the meanings of the single names and their prognostics. All this is found in the book Samhitā.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VIL.—Lustrum.</td>
<td>31.</td>
<td>32.</td>
<td>33.</td>
<td>34.</td>
<td>35.</td>
</tr>
<tr>
<td>----------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Indifferent. Its lord Pitáras, i.e. the fathers</td>
<td>Hemalamba.</td>
<td>Vilmān.</td>
<td>Viśārīn.</td>
<td>Śārvānt (?).</td>
<td>Plava.</td>
</tr>
<tr>
<td>VIII.—Lustrum.</td>
<td>36.</td>
<td>37.</td>
<td>38.</td>
<td>39.</td>
<td>40.</td>
</tr>
<tr>
<td>Indifferent. Its lord Siva, i.e. the creatures</td>
<td>Śokakrīt.</td>
<td>Śubhashkrit.</td>
<td>Krodhin.</td>
<td>Viśvavasu.</td>
<td>Parāvasu.</td>
</tr>
<tr>
<td>IX.—Lustrum.</td>
<td>41.</td>
<td>42.</td>
<td>43.</td>
<td>44.</td>
<td>45.</td>
</tr>
<tr>
<td>X.—Lustrum.</td>
<td>46.</td>
<td>47.</td>
<td>48.</td>
<td>49.</td>
<td>50.</td>
</tr>
<tr>
<td>XI.—Lustrum.</td>
<td>51.</td>
<td>52.</td>
<td>53.</td>
<td>54.</td>
<td>55.</td>
</tr>
<tr>
<td>XII.—Lustrum.</td>
<td>56.</td>
<td>57.</td>
<td>58.</td>
<td>59.</td>
<td>60.</td>
</tr>
</tbody>
</table>
CHAPTER LXII.

This is the method for the determination of the years of the shashtyabda, as recorded in their books. However, I have seen Hindus who subtract 3 from the era of Vikramâditya, and divide the remainder by 60. The remainder they count off from the beginning of the great yuga. This method is not worth anything. By-the-bye, it is the same whether you reckon in the manner mentioned, or add 12 to the Śakakāla.

I have come across some people from the country of Kanoj who told me that, with them, the cycle of samvatsaras has 1248 years, each single one of the twelve samvatsaras having 104 years. According to this statement we must subtract 554 from the Śakakāla, and with the remainder compare the following diagram. In the corresponding column you see in which samvatsara the year in question lies, and how many years of the samvatsara have already elapsed:

<table>
<thead>
<tr>
<th>The years</th>
<th>1.</th>
<th>105.</th>
<th>209.</th>
<th>313.</th>
<th>417.</th>
<th>521.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The years</td>
<td>625</td>
<td>729.</td>
<td>833.</td>
<td>937.</td>
<td>1041.</td>
<td>1145.</td>
</tr>
</tbody>
</table>

When I heard, among these pretended names of samvatsaras, names of nations, trees, and mountains, I conceived a suspicion of my reporters, more particularly as their chief business was indeed to practise hocus-pocus and deception (as jugglers?); and a dyed beard proves its bearer to be a liar. I used great care in examining every single one of them, in repeating the same questions at different times, in a different order and context. But lo! what different answers did I get! God is all-wise!
CHAPTER LXIII.

ON THAT WHICH ESPECIALLY CONCERNS THE BRAHMANS, AND WHAT THEY ARE OBLIGED TO DO DURING THEIR WHOLE LIFE.

The life of the Brahman, after seven years of it have passed, is divided into four parts. The first part begins with the eighth year, when the Brahmans come to him to instruct him, to teach him his duties, and to enjoin him to adhere to them and to embrace them as long as he lives. Then they bind a girdle round his waist and invest him with a pair of yajnopavittas, i.e. one strong cord consisting of nine single cords which are twisted together, and with a third yajnopavitta, a single one made from cloth. This girdle runs from the left shoulder to the right hip. Further, he is presented with a stick which he has to wear, and with a seal-ring of a certain grass, called darbha, which he wears on the ring-finger of the right hand. This seal-ring is also called paurāṇa. The object of his wearing the ring on the ring-finger of his right hand is this, that it should be a good omen and a blessing for all those who receive gifts from that hand. The obligation of wearing the ring is not quite so stringent as that of wearing the yajnopavitta, for from the latter he is not to separate himself under any circumstances whatever. If he takes it off while eating or fulfilling some want of nature, he thereby commits a sin which cannot be wiped off save by some work of expiation, fasting, or almsgiving.
CHAPTER LXIII.

This first period of the Brahman's life extends till the twenty-fifth year of his age, or, according to the Vishnu-Purana, till his forty-eighth year. His duty is to practise abstinence, to make the earth his bed, to begin with the learning of the Veda and of its explanation, of the science of theology and law, all this being taught to him by a master whom he serves day and night. He washes himself thrice a day, and performs a sacrifice to the fire both at the beginning and end of the day. After the sacrifice he worships his master. He fasts a day and he breaks fast a day, but he is never allowed to eat meat. He dwells in the house of the master, which he only leaves in order to ask for a gift and to beg in not more than five houses once a day, either at noon or in the evening. Whatever alms he receives he places before his master to choose from it what he likes. Then the master allows him to take the remainder. Thus the pupil nourishes himself from the remains of the dishes of his master. Further, he fetches the wood for the fire, wood of two kinds of trees, palas (Butea frondosa) and darbha, in order to perform the sacrifice; for the Hindus highly venerate the fire, and offer flowers to it. It is the same case with all other nations. They always thought that the sacrifice was accepted by the deity if the fire came down upon it, and no other worship has been able to draw them away from it, neither the worship of idols nor that of stars, cows, asses, or images. Therefore Bashshâr Ibn Burd says: “Since there is fire, it is worshipped.”

The second period of their life extends from the twenty-fifth year till the fiftieth, or, according to the Vishnu-Purana, till the seventieth. The master allows him to marry. He marries, establishes a household, and intends to have descendants, but he cohabits with his wife only once in a month after she has become clean of the menstruation. He is not allowed to marry a woman above twelve years of age. He gains his sustenance either by the fee he
obtains for teaching Brahmans and Kshatriyas, not as a payment, but as a present, or by presents which he receives from some one because he performs for him the sacrifices to the fire, or by asking a gift from the kings and nobles, there being no importunate pressing on his part, and no unwillingness on the part of the giver. There is always a Brahman in the houses of those people, who there administers the affairs of religion and the works of piety. He is called purohita. Lastly, the Brahman lives from what he gathers on the earth or from the trees. He may try his fortune in the trade of clothes and betel-nuts, but it is preferable that he should not trade himself, and that a Vaiśya should do the business for him, because originally trade is forbidden on account of the deceiving and lying which are mixed up with it. Trading is permitted to him only in case of dire necessity, when he has no other means of sustenance. The Brahmans are not, like the other castes, bound to pay taxes and to perform services to the kings. Further, he is not allowed continually to busy himself with horses and cows, with the care for the cattle, nor with gaining by usury. The blue colour is impure for him, so that if it touches his body, he is obliged to wash himself. Lastly, he must always beat the drum before the fire, and recite for it the prescribed holy texts.

The third period of the life of the Brahman extends from the fiftieth year to the seventy-fifth, or, according to the Vishnu-Purāṇa, till the ninetieth. He practises abstinence, leaves his household, and hands it as well as his wife over to his children, if the latter does not prefer to accompany him into the life in the wilderness. He dwells outside civilisation, and leads the same life again which he led in the first period. He does not take shelter under a roof, nor wear any other dress but some bark of a tree, simply sufficient to cover his loins. He sleeps on the earth without any bed, and only
nourishes himself by fruit, vegetables, and roots. He lets the hair grow long, and does not anoint himself with oil.

The fourth period extends till the end of life. He wears a red garment and holds a stick in his hand. He is always given to meditation; he strips the mind of friendship and enmity, and roots out desire, and lust, and wrath. He does not converse with anybody at all. When walking to a place of a particular merit, in order to gain a heavenly reward, he does not stop on the road in a village longer than a day, nor in a city longer than five days. If any one gives him something, he does not leave a remainder of it for the following day. He has no other business but that of caring for the path which leads to salvation, and for reaching moksha, whence there is no return to this world.

The universal duties of the Brahman throughout his whole life are works of piety, giving alms and receiving them. For that which the Brahmans give reverts to the pitaras (is in reality a benefit to the Fathers). He must continually read, perform the sacrifices, take care of the fire which he lights, offer before it, worship it, and preserve it from being extinguished, that he may be burned by it after his death. It is called homa.

Every day he must wash himself thrice: at the savindhi of rising, i.e. morning dawn, at the savindhi of setting, i.e. evening twilight, and between them in the middle of the day. The first washing is on account of sleep, because the openings of the body have become lax during it. Washing is a cleansing from accidental impurity and a preparation for prayer.

Their prayer consists of praise, glorification, and prostration according to their peculiar manner, viz. prostrating themselves on the two thumbs, whilst the two palms of the hands are joined, and they turn their faces towards the sun. For the sun is their kibla, wherever he may be, except when in the south. For they do not
perform any work of piety with the face turned southward; only when occupied with something evil and unlucky they turn themselves towards the south.

The time when the sun declines from the meridian (the afternoon) is well suited for acquiring in it a heavenly reward. Therefore at this time the Brahman must be clean.

The evening is the time of supper and of prayer. The Brahman may take his supper and pray without having previously washed himself. Therefore, evidently, the rule as to the third washing is not as stringent as that relating to the first and second washings.

A nightly washing is obligatory for the Brahman only at the times of eclipses, that he should be prepared to perform the rules and sacrifices prescribed for that occasion.

The Brahman, as long as he lives, eats only twice a day, at noon and at nightfall; and when he wants to take his meal, he begins by putting aside as much as is sufficient for one or two men as alms, especially for strange Brahmans who happen to come at evening-time asking for something. To neglect their maintenance would be a great sin. Further, he puts something aside for the cattle, the birds, and the fire. Over the remainder he says prayers and eats it. The remainder of his dish he places outside his house, and does not any more come near it, as it is no longer allowable for him, being destined for the chance passer-by who wants it, be he a man, bird, dog, or something else.

The Brahman must have a water-vessel for himself. If another one uses it, it is broken. The same remark applies to his eating-instruments. I have seen Brahmans who allowed their relatives to eat with them from the same plate, but most of them disapprove of this.

He is obliged to dwell between the river Sindh in the north and the river Camañvati in the south. He is not allowed to cross either of these frontiers so as
to enter the country of the Turks or of the Karnata. Further, he must live between the ocean in the east and west. People say that he is not allowed to stay in a country in which the grass which he wears on the ring-finger does not grow, nor the black-haired gazelles graze. This is a description for the whole country within the just-mentioned boundaries. If he passes beyond them he commits a sin.

In a country where not the whole spot in the house which is prepared for people to eat upon it is plastered with clay, where they, on the contrary, prepare a separate tablecloth for each person eating by pouring water over a spot and plastering it with the dung of cows, the shape of the Brahman’s tablecloth must be square. Those who have the custom of preparing such tablecloths give the following as the cause of this custom: —The spot of eating is soiled by the eating. If the eating is finished, the spot is washed and plastered to become clean again. If, now, the soiled spot is not distinguished by a separate mark, you would suppose also the other spots to be soiled, since they are similar to and cannot be distinguished from each other.

Five vegetables are forbidden to them by the religious code:—Onions, garlic, a kind of gourd, the root of a plant like the carrots called ‘krnnn (?), and another vegetable which grows round their tanks called ‘nnlt."
CHAPTER LXIV.

ON THE RITES AND CUSTOMS WHICH THE OTHER CASTES, 
BESIDES THE BRAHMANS, PRACTISE DURING THEIR 
LIFETIME.

The Kshatriya reads the Veda and learns it, but does not teach it. He offers to the fire and acts according to the rules of the Purāṇas. In places where, as we have mentioned (v. p. 135), a tablecloth is prepared for eating, he makes it angular. He rules the people and defends them, for he is created for this task. He girds himself with a single cord of the threefold yajnopavita, and a single other cord of cotton. This takes place after he has finished the twelfth year of his life.

It is the duty of the Vaiśya to practise agriculture and to cultivate the land, to tend the cattle and to remove the needs of the Brahmans. He is only allowed to gird himself with a single yajnopavita, which is made of two cords.

The Śūdra is like a servant to the Brahman, taking care of his affairs and serving him. If, though being poor in the extreme, he still desires not to be without a yajnopavita, he girds himself only with the linen one. Every action which is considered as the privilege of a Brahman, such as saying prayers, the recitation of the Veda, and offering sacrifices to the fire, is forbidden to him, to such a degree that when, e.g. a Śūdra or a Vaiśya is proved to have recited the Veda, he is accused by the Brahmans before the ruler, and the latter will order his tongue to be cut off. However, the meditation on God,
CHAPTER LXIV.

works of piety, and almsgiving are not forbidden to him.

Every man who takes to some occupation which is not allowed to his caste, as, e.g. a Brahman to trade, a Sūdra to agriculture, commits a sin or crime, which they consider only a little less than the crime of theft.

The following is one of the traditions of the Hindus: —In the days of King Rāma human life was very long, always of a well-defined and well-known length. Thus a child never died before its father. Then, however, it happened that the son of a Brahman died while the father was still alive. Now the Brahman brought his child to the door of the king and spoke to him: "This innovation has sprung up in thy days for no other reason but this, that there is something rotten in the state of the country, and because a certain Vazir commits in thy realm what he commits." Then Rāma began to inquire into the cause of this, and finally they pointed out to him a Caṇḍāla who took the greatest pains in performing worship and in self-torment. The king rode to him and found him on the banks of the Ganges, hanging on something with his head downward. The king bent his bow, shot at him, and pierced his bowels. Then he spoke: "That is it! I kill thee on account of a good action which thou art not allowed to do." When he returned home, he found the son of the Brahman, who had been deposited before his door, alive.

All other men except the Caṇḍāla, as far as they are not Hindus, are called mleccha, i.e. unclean, all those who kill men and slaughter animals and eat the flesh of cows.

All these things originate in the difference of the classes or castes, one set of people treating the others as fools. This apart, all men are equal to each other, as Vāsudeva says regarding him who seeks salvation: "In the judgment of the intelligent man, the Brahman
and the Cāndāla are equal, the friend and the foe, the faithful and the deceitful, nay, even the serpent and the weasel. If to the eyes of intelligence all things are equal, to ignorance they appear as separated and different."

Vāsudeva speaks to Arjuna: "If the civilisation of the world is that which is intended, and if the direction of it cannot proceed without our fighting for the purpose of suppressing evil, it is the duty of us who are the intelligent to act and to fight, not in order to bring to an end that which is deficient within us, but because it is necessary for the purpose of healing what is ill and banishing destructive elements. Then the ignorant imitate us in acting, as the children imitate their elders, without their knowing the real aim and purport of actions. For their nature has an aversion to intellectual methods, and they use force only in order to act in accordance with the influences of lust and passion on their senses. In all this, the intelligent and educated man is directly the contrary of them."
CHAPTER LXV.

ON THE SACRIFICES.

Most of the Veda treats of the sacrifices to the fire, and describes each one of them. They are different in extent, so that certain of them can only be performed by the greatest of their kings. So, e.g. the _abdamedha_.

A mare is let freely to wander about in the country grazing, without anybody’s hindering her. Soldiers follow her, drive her, and cry out before her: “She is the king of the world. He who does not agree, let him come forward.” The Brahmans walk behind her and perform sacrifices to the fire where she casts dung. When she thus has wandered about through all parts of the world, she becomes food for the Brahmans and for him whose property she is.

Further, the sacrifices differ in duration, so that only he could perform certain of them who live a very long life; and such long lives do no longer occur in this our age. Therefore most of them have been abolished, and only few of them remain and are practised nowadays.

According to the Hindus, the fire eats everything. Therefore it becomes defiled, if anything unclean is mixed up with it, as, e.g. water. Accordingly they are very punctilious regarding fire and water if they are in the hands of non-Hindus, because they are defiled by being touched by them.

That which the fire eats for its share, reverts to the Devas, because the fire comes out of their mouths.
What the Brahmins present to the fire to eat is oil and different cereals—wheat, barley, and rice—which they throw into the fire. Further, they recite the prescribed texts of the Veda in case they offer on their own behalf. However, if they offer in the name of somebody else, they do not recite anything.

The *Vishnu-Dharma* mentions the following tradition:—Once upon a time there was a man of the class of the Daityas, powerful and brave, the ruler of a wide realm called Hiranyaksha. He had a daughter of the name of Dkshah (?), who was always bent upon worship and trying herself by fasting and abstinence. Thereby she had earned as reward a place in heaven. She was married to Mahâdeva. When he, then, was alone with her and did with her according to the custom of the Devas, i.e. cohabiting very long and transferring the semen very slowly, the fire became aware of it and became jealous, fearing lest the two might procreate a fire similar to themselves. Therefore it determined to defile and to ruin them.

When Mahâdeva saw the fire, his forehead became covered with sweat from the violence of his wrath, so that some of it dropped down to the earth. The earth drank it, and became in consequence pregnant with Mars, i.e. Skanda, the commander of the army of the Devas.

Rudra, the destroyer, seized a drop of the semen of Mahâdeva and threw it away. It was scattered in the interior of the earth, and represents all atom-like substances (?).

The fire, however, became leprous, and felt so much ashamed and confounded that it plunged down into *patâla*, i.e. the lowest earth. As, now, the Devas missed the fire, they went out to search for it.

First, the frogs pointed it out to them. The fire, on seeing the Devas, left its place and concealed itself in the tree *anuvatika*, laying a curse on the frogs, that they
CHAPTER LXV.

should have a horrid croaking and be odious to all others.

Next, the parrots betrayed to the Devas the hiding-place of the fire. Thereupon the fire cursed them, that their tongues should be turned topsy-turvy, that their root should be where its tip ought to be. But the Devas spoke to them: “If your tongue is turned topsy-turvy, you shall speak in human dwellings and eat delicate things.”

The fire fled from the ávattha tree to the tree kâmi. Thereupon the elephant gave a hint to the Devas regarding its hiding-place. Now it cursed the elephant that his tongue should be turned topsy-turvy. But then the Devas spoke to him: “If your tongue is turned topsy-turvy, you shall participate with man in his victuals and understand his speech.”

At last they hit upon the fire, but the fire refused to stay with them because it was leprous. Now the Devas restored it to health, and freed it from the leprosy. The Devas brought back to them the fire with all honour and made it a mediator between themselves and mankind, receiving from the latter the shares which they offer to the Devas, and making these shares reach them.
CHAPTER LXVI.

ON PILGRIMAGE AND THE VISITING OF SACRED PLACES.

Pilgrimages are not obligatory to the Hindus, but facultative and meritorious. A man sets off to wander to some holy region, to some much venerated idol or to some of the holy rivers. He worships in them, worships the idol, makes presents to it, recites many hymns and prayers, fasts, and gives alms to the Brāhmans, the priests, and others. He shaves the hair of his head and beard, and returns home.

The holy much venerated ponds are in the cold mountains round Meru. The following information regarding them is found in both the Vāyu and the Matsya Purāṇas:—

"At the foot of Meru there is Arhata (?), a very great pond, described as shining like the moon. In it originates the river Zanba (? Jambu), which is very pure, flowing over the purest gold.

"Near the mountain Śveta there is the pond Uttaramānas, and around it twelve other ponds, each of them like a lake. Thence come the two rivers Sāṇḍī (? ) and Maddhyandā (? ), which flow to Kimpurusha.

"Near the mountain Nila there is the pond pynd (pitanda ?) adorned with lotuses.

"Near the mountain Nishadha there is the pond Vishnupada, whence comes the river Sarasvatī, i.e., Sarsuti. Besides, the river Gandharvī comes from there.

"In the mountain Kailāsa there is the pond Manda, as large as a sea, whence comes the river Mandākini."
"North-east of Kailāsa there is the mountain Candraparvata, and at its foot the pond Ācūḍ (?), whence comes the river Ācūḍ.

"South-east of Kailāsa there is the mountain Lohita, and at its foot a pond called Lohita. Thence comes the river Lohitanadī.

"South of Kailāsa there is the mountain Sarayuśāti (?), and at its foot the pond Mānasa. Thence comes the river Sarayu.

"West of Kailāsa there is the mountain Aruṇa, always covered with snow, which cannot be ascended. At its foot is the pond Śailōdā, whence comes the river Śailōdā.

"North of Kailāsa there is the mountain Gaura (?), and at its foot the pond C-u-d-sara (?), i.e. having golden sand. Near this pond the King Bhagiratha led his anchorite life.

"His story is as follows:—A king of the Hindus called Sagara had 60,000 sons, all of them bad, mean fellows. Once they happened to lose a horse. They at once searched for it, and in searching they continually ran about so violently that in consequence the surface of the earth broke in. They found the horse in the interior of the earth standing before a man who was looking down with deep-sunken eyes. When they came near him he smote them with his look, in consequence of which they were burned on the spot and went to hell on account of their wicked actions.

"The collapsed part of the earth became a sea, the great ocean. A king of the descendants of that king, called Bhagiratha, on hearing the history of his ancestors, was much affected thereby. He went to the above-mentioned pond, the bottom of which was polished gold, and stayed there, fasting all day and worshipping during the nights. Finally, Mahādeva asked him what he wanted; upon which he answered,
'I want the river Ganges which flows in Paradise,' knowing that to any one over whom its water flows all his sins are pardoned. Mahâdeva granted him his desire. However, the Milky Way was the bed of the Ganges, and the Ganges was very haughty, for nobody had ever been able to stand against it. Now Mahâdeva took the Ganges and put it on his head. When the Ganges could not move away, he became very angry and made a great uproar. However, Mahâdeva held him firmly, so that it was not possible for anybody to plunge into it. Then he took part of the Ganges and gave it to Bhagtratha, and this king made the middle one of its seven branches flow over the bones of his ancestors, whereby they became liberated from punishment. Therefore the Hindus throw the burned bones of their dead into the Ganges. The Ganges was also called by the name of that king who brought him to earth, i.e. Bhagtratha.'

We have already quoted Hindu traditions to the effect that in the Dvipas there are rivers as holy as the Ganges. In every place to which some particular holiness is ascribed, the Hindus construct ponds intended for the ablutions. In this they have attained to a very high degree of art, so that our people (the Muslims), when they see them, wonder at them, and are unable to describe them, much less to construct anything like them. They build them of great stones of an enormous bulk, joined to each other by sharp and strong cramp-irons, in the form of steps (or terraces) like so many ledges; and these terraces run all around the pond, reaching to a height of more than a man’s stature. On the surface of the stones between two terraces they construct staircases rising like pinnacles. Thus the first steps or terraces are like roads (leading round the pond), and the pinnacles are steps (leading up and down). If ever so many people descend to the pond whilst others ascend, they do not meet each other, and
the road is never blocked up, because there are so many terraces, and the ascending person can always turn aside to another terrace than that on which the descending people go. By this arrangement all troublesome thronging is avoided.

In Multân there is a pond in which the Hindus worship by bathing themselves, if they are not prevented.

The Śaṁhitā of Varāhamihira relates that in Tâne-shar there is a pond which the Hindus visit from afar to bathe in its water. Regarding the cause of this custom they relate the following:—The waters of all the other holy ponds visit this particular pond at the time of an eclipse. Therefore, if a man washes in it, it is as if he had washed in every single one of all of them. Then Varāhamihira continues: “People say, if it were not the head (apsis) which causes the eclipse of sun and moon, the other ponds would not visit this pond.”

The ponds become particularly famous for holiness either because some important event has happened at them, or because there is some passage in the holy text or tradition which refers to them. We have already quoted words spoken by Śaunaka. Venus had related them to him on the authority of Brahman, to whom they had originally been addressed. In this text King Bali also is mentioned, and what he would do till the time when Nârâyana would plunge him down to the lowest earth. In the same text occurs the following passage:—“I do that to him only for this purpose that the equality between men, which he desires to realise, shall be done away with, that men shall be different in their conditions of life, and that on this difference the order of the world is to be based; further, that people shall turn away from his worship and worship me and believe in me. The mutual assistance of civilised people presupposes a certain difference

VOL. II. 

K
among them, in consequence of which the one requires the other. According to the same principle, God has created the world as containing many differences in itself. So the single countries differ from each other, one being cold, the other warm; one having good soil, water, and air, the other having bitter salt soil, dirty and bad smelling water, and unhealthy air. There are still more differences of this kind; in some cases advantages of all kinds being numerous, in others few. In some parts there are periodically returning physical disasters; in others they are entirely unknown. All these things induce civilised people carefully to select the places where they want to build towns.

That which makes people do these things is usage and custom. However, religious commands are much more powerful, and influence much more the nature of man than usages and customs. The bases of the latter are investigated, explored, and accordingly either kept or abandoned, whilst the bases of the religious commands are left as they are, not inquired into, adhered to by the majority simply on trust. They do not argue over them, as the inhabitants of some sterile region do not argue over it, since they are born in it and do not know anything else, for they love the country as their fatherland, and find it difficult to leave it. If, now, besides physical differences, the countries differ from each other also in law and religion, there is so much attachment to it in the hearts of those who live in them that it can never be rooted out.”

The Hindus have some places which are venerated for reasons connected with their law and religion, e.g. Benares (Bārānāst). For their anchorites wander to it and stay there for ever, as the dwellers of the Ka‘ba stay for ever in Mekka. They want to live there to the end of their lives, that their reward after death should be the better for it. They say that a murderer
CHAPTER LXVI.

is held responsible for his crime and punished with a punishment due to his guilt, except in case he enters the city of Benares, where he obtains pardon. Regarding the cause of the holiness of this asylum they relate the following story:

"Brahman was in shape four-headed. Now there happened some quarrel between him and Šamkara, i.e. Mahâdeva, and the succeeding fight had this result, that one of the heads of Brahman was torn off. At that time it was the custom that the victor took the head of the slain adversary in his hand and let it hang down from his hand as an act of ignominy to the dead and as a sign of his own bravery. Further, a bridle was put into the mouth (?). Thus the head of Brahman was dishonoured by the hand of Mahâdeva, who took it always with him wherever he went and whatever he did. He never once separated himself from it when he entered the towns, till at last he came to Benares. After he had entered Benares the head dropped from his hand and disappeared."

A similar place is Pûkara, the story of which is this: Brahman once was occupied in offering there to the fire, when a pig came out of the fire. Therefore they represent his image there as that of a pig. Outside the town, in three places, they have constructed ponds which stand in high veneration, and are places of worship.

Another place of the kind is Tâneshar, also called Kurukshetra, i.e. the land of Kuru, who was a peasant, a pious, holy man, who worked miracles by divine power. Therefore the country was called after him, and venerated for his sake. Besides, Tâneshar is the theatre of the exploits of Vâsudeva in the wars of Bhârata and of the destruction of the evil-doers. It is for this reason that people visit the place.

Mâhûra, too, is a holy place, crowded with Brahmans.
It is venerated because Vāsudeva was there born and brought up, in a place in the neighbourhood called Nandagola.

Nowadays the Hindus also visit Kashmir. Lastly, they used to visit Māltān before its idol-temple was destroyed.
CHAPTER LXVII.

ON ALMS, AND HOW A MAN MUST SPEND WHAT HE EARNS.

It is obligatory with them every day to give alms as much as possible. They do not let money become a year or even a month old, for this would be a draft on an unknown future, of which a man does not know whether he reaches it or not.

With regard to that which he earns by the crops or from the cattle, he is bound first to pay to the ruler of the country the tax which attaches to the soil or the pasture-ground. Further, he pays him one-sixth of the income in recognition of the protection which he affords to the subjects, their property, and their families. The same obligation rests also on the common people, but they will always lie and cheat in the declarations about their property. Further, trading businesses, too, pay a tribute for the same reason. Only the Brahmans are exempt from all these taxes.

As to the way in which the remainder of the income, after the taxes have been deducted, is to be employed, there are different opinions. Some destine one-ninth of it for alms. For they divide it into three parts. One of them is kept in reserve to guarantee the heart against anxiety. The second is spent on trade to bring profit, and one-third of the third portion (i.e. one-ninth of the whole) is spent on alms, whilst the two other thirds are spent according to the same rule.

Others divide this income into four portions. One-
fourth is destined for common expenses, the second for liberal works of a noble mind, the third for alms, and the fourth for being kept in reserve, i.e. not more of it than the common expenses for three years. If the quarter which is to be reserved exceeds this amount, only this amount is reserved, whilst the remainder is spent as alms.

Usury or taking percentages is forbidden. The sin which a man commits thereby corresponds to the amount by which the percentages have increased the capital stock. Only to the Śūdra is it allowed to take percentages, as long as his profit is not more than one-fiftieth of the capital (i.e. he is not to take more than two per cent.).
CHAPTER LXVIII.

ON WHAT IS ALLOWED AND FORBIDDEN IN EATING
AND DRINKING.

Originally killing in general was forbidden to them, as it is to the Christians and Manichæans. People, however, have the desire for meat, and will always fling aside every order to the contrary. Therefore the here-mentioned law applies in particular only to the Brahmans, because they are the guardians of the religion, and because it forbids them to give way to their lusts. The same rule applies to those members of the Christian clergy who are in rank above the bishops, viz. the metropolitans, the catholici, and the patriarchs, not to the lower grades, such as presbyter and deacon, except in the case that a man who holds one of these degrees is at the same time a monk.

As matters stand thus, it is allowed to kill animals by means of strangulation, but only certain animals, others being excluded. The meat of such animals, the killing of which is allowed, is forbidden in case they die a sudden death. Animals the killing of which is allowed are sheep, goats, gazelles, hares, rhinoceroses (gandha), the buffaloes, fish, water and land birds, as sparrows, ring-doves, francolins, doves, peacocks, and other animals which are not loathsome to man nor noxious.

That which is forbidden are cows, horses, mules, asses, camels, elephants, tame poultry, crows, parrots, nightingales, all kinds of eggs and wine. The latter is
allowed to the Śādra. He may drink it, but dare not sell it, as he is not allowed to sell meat.

Some Hindus say that in the time before Bhārata it was allowed to eat the meat of cows, and that, there then existed sacrifices part of which was the killing of cows. After that time, however, it had been forbidden on account of the weakness of men, who were too weak to fulfil their duties, as also the Veda, which originally was only one, was afterwards divided into four parts, simply for the purpose of facilitating the study of it to men. This theory, however, is very little substantiated, as the prohibition of the meat of cows is not an alleviating and less strict measure, but, on the contrary, one which is more severe and more restrictive than the former law.

Other Hindus told me that the Brahmans used to suffer from the eating of cows’ meat. For their country is hot, the inner parts of the bodies are cold, the natural warmth becomes feeble in them, and the power of digestion is so weak that they must strengthen it by eating the leaves of betel after dinner, and by chewing the betel-nut. The hot betel inflames the heat of the body, the chalk on the betel-leaves dries up everything wet, and the betel-nut acts as an astringent on the teeth, the gums, and the stomach. As this is the case, they forbade eating cows’ meat, because it is essentially thick and cold.

I, for my part, am uncertain, and hesitate in the question of the origin of this custom between two different views.

(Lacuna in the manuscript.)

As for the economical reason, we must keep in mind that the cow is the animal which serves man in travelling by carrying his loads, in agriculture in the works of ploughing and sowing, in the household by the milk and the product made thereof. Further, man makes use of its dung, and in winter-time even of its breath.
Therefore it was forbidden to eat cows' meat; as also Alhajjâj forbade it, when people complained to him that Babylonia became more and more desert.

I have been told the following passage is from an Indian book: "All things are one, and whether allowed or forbidden, equal. They differ only in weakness and power. The wolf has the power to tear the sheep; therefore the sheep is the wolf's food, for the former cannot oppose the latter, and is his prey." I have found in Hindu books passages to the same effect. However, such views come to the intelligent man only by knowledge, when in it he has attained to such a degree that a Brahman and a Cândâla are equal to him. If he is in this state, all other things also are equal to him, in so far as he abstains from them. It is the same if they are all allowed to him, for he can dispense with them, or if they are forbidden to him, for he does not desire them. As to those, however, who require these things, being in the yoke of ignorance, something is allowed to them, something forbidden, and thereby a wall is erected between the two kinds of things.
CHAPTER LXIX.

ON MATRIMONY, THE MENSTRUAL COURSES, EMBRYOS, AND CHILDBED.

No nation can exist without a regular married life, for it prevents the uproar of passions abhorred by the cultivated mind, and it removes all those causes which excite the animal to a fury always leading to harm. Considering the life of the animals by pairs, how the one member of the pair helps the other, and how the lust of other animals of the same species is kept aloof from them, you cannot help declaring matrimony to be a necessary institution; whilst disorderly cohabitation or harlotry on the part of man is a shameful proceeding, that does not even attain to the standing of the development of animals, which in every other respect stand far below him.

Every nation has particular customs of marriage, and especially those who claim to have a religion and law of divine origin. The Hindus marry at a very young age; therefore the parents arrange the marriage for their sons. On that occasion the Brahmans perform the rites of the sacrifices, and they as well as others receive alms. The implements of the wedding rejoicings are brought forward. No gift is settled between them. The man gives only a present to the wife, as he thinks fit, and a marriage gift in advance, which he has no right to claim back, but the wife may give it back to him of her own will. Husband and wife can only be separated by death, as they have no divorce.
A man may marry one to four wives. He is not allowed to take more than four; but if one of his wives die, he may take another one to complete the legitimate number. However, he must not go beyond it.

If a wife loses her husband by death, she cannot marry another man. She has only to chose between two things—either to remain a widow as long as she lives or to burn herself; and the latter eventuality is considered the preferable, because as a widow she is ill-treated as long as she lives. As regards the wives of the kings, they are in the habit of burning them, whether they wish it or not, by which they desire to prevent any of them by chance committing something unworthy of the illustrious husband. They make an exception only for women of advanced years and for those who have children; for the son is the responsible protector of his mother.

According to their marriage law it is better to marry a stranger than a relative. The more distant the relationship of a woman with regard to her husband the better. It is absolutely forbidden to marry related women both of the direct descending line, viz. a granddaughter or great-granddaughter, and of the direct ascending line, viz. a mother, grandmother, or great-grandmother. It is also forbidden to marry collateral relations, viz. a sister, a niece, a maternal or paternal aunt and their daughters, except in case the couple of relations who want to marry each other be removed from each other by five consecutive generations. In that case the prohibition is waived, but, notwithstanding, such a marriage is an object of dislike to them.

Some Hindus think that the number of the wives depends upon the caste; that, accordingly, a Brahman may take four, a Kshatriya three, a Vaisya two wives, and a Śādra one. Every man of a caste may marry a woman of his own caste or one of the castes or caste
below his; but nobody is allowed to marry a woman of a caste superior to his own.

The child belongs to the caste of the mother, not to that of the father. Thus, e.g. if the wife of a Brahman is a Brahman, her child also is a Brahman; if she is a Śūdra, her child is a Śūdra. In our time, however, the Brahmans, although it is allowed to them, never marry any woman except one of their own caste.

The longest duration of the menstrual courses which has been observed is sixteen days, but in reality they last only during the first four days, and then the husband is not allowed to cohabit with his wife, nor even to come near her in the house, because during this time she is impure. After the four days have elapsed and she has washed, she is pure again, and the husband may cohabit with her, even if the blood has not yet entirely disappeared; for this blood is not considered as that of the menstrual courses, but as the same substance-matter of which the embryos consist.

It is the duty (of the Brahman), if he wants to cohabit with a wife to get a child, to perform a sacrifice to the fire called garbhadāna; but he does not perform it, because it requires the presence of the woman, and therefore he feels ashamed to do so. In consequence he postpones the sacrifice and unites it with the next following one, which is due in the fourth month of the pregnancy, called simarionnayanam. After the wife has given birth to the child, a third sacrifice is performed between the birth and the moment when the mother begins to nourish the child. It is called jūta-kārman.

The child receives a name after the days of the childbed have elapsed. The sacrifice for the occasion of the name-giving is called nāmakārman.

As long as the woman is in childbed, she does not touch any vessel, and nothing is eaten in her house, nor does the Brahman light there a fire. These days are
eight for the Brahman, twelve for the Kshatriya, fifteen for the Vaiśya, and thirty for the Śūdra. For the low-caste people which are not reckoned among any caste, no term is fixed.

The longest duration of the suckling of the child is three years, but there is no obligation in this matter. The sacrifice on the occasion of the first cutting of the child’s hair is offered in the third, the perforation of the ear takes place in the seventh and eighth years.

People think with regard to harlotry that it is allowed with them. Thus, when Kâbul was conquered by the Muslims and the Ispahbad of Kâbul adopted Islâm, he stipulated that he should not be bound to eat cows’ meat nor to commit sodomy (which proves that he abhorred the one as much as the other). In reality, the matter is not as people think, but it is rather this, that the Hindus are not very severe in punishing whoredom. The fault, however, in this lies with the kings, not with the nation. But for this, no Brahman or priest would suffer in their idol-temples the women who sing, dance, and play. The kings make them an attraction for their cities, a bait of pleasure for their subjects, for no other but financial reasons. By the revenues which they derive from the business both as fines and taxes, they want to recover the expenses which their treasury has to spend on the army.

In a similar way the Buyide prince ‘Aḍud-al-da‘ula acted, who besides also had a second aim in view, viz. that of protecting his subjects against the passions of his unmarried soldiers.
CHAPTER LXX.

ON LAWSUITS.

The judge demands from the suitor a document written against the accused person in a well-known writing which is thought suitable for writs of the kind, and in the document the well-established proof of the justice of his suit. In case there is no written document, the contest is settled by means of witnesses without a written document.

The witnesses must not be less than four, but there may be more. Only in case the justice of the deposition of a witness is perfectly established and certain before the judge, he may admit it, and decide the question alone on the basis of the deposition of this sole witness. However, he does not admit prying about in secret, deriving arguments from mere signs or indications in public, concluding by analogy from one thing which seems established about another, and using all sorts of tricks to elicit the truth, as 'Iyās Ibu Mu'āwiya used to do.

If the suitor is not able to prove his claim, the defendant must swear, but he may also tender the oath to the suitor by saying, "Swear thou that thy claim is true and I will give thee what thou claimest."

There are many kinds of the oath, in accordance with the value of the object of the claim. If the object is of no great importance, and the suitor agrees that the accused person shall swear, the latter simply swears before five learned Brahmans in the following words:
“If I lie, he shall have as recompense as much of my goods as is equal to the eightfold of the amount of his claim.”

A higher sort of oath is this: The accused person is invited to drink the bish (visha ?) called brahma (2). It is one of the worst kinds; but if he speaks the truth, the drink does not do him any harm.

A still higher sort of ordeal is this: They bring the man to a deep and rapidly flowing river, or to a deep well with much water. Then he speaks to the water: “Since thou belongest to the pure angels, and knowest both what is secret and public, kill me if I lie, and preserve me if I speak the truth.” Then five men take him between them and throw him into the water. If he has spoken the truth, he will not drown and die.

A still higher sort is the following: The judge sends both claimant and defendant to the temple of the most venerated idol of the town or realm. There the defendant has to fast during that day. On the following day he dresses in new garments, and posts himself together with the claimant in that temple. Then the priests pour water over the idol and give it him to drink. If he, then, has not spoken the truth, he at once vomits blood.

A still higher sort is the following: The defendant is placed on the scale of a balance, and is weighed; whereupon he is taken off the scale, and the scale is left as it is. Then he invokes as witnesses for the truth of his deposition the spiritual beings, the angels, the heavenly beings, one after the other, and all which he speaks he writes down on a piece of paper, and fastens it to his head. He is a second time placed in the scale of the balance. In case he has spoken the truth, he now weighs more than the first time.

There is also a still higher sort. It is the following: They take butter and sesame-oil in equal quantities, and
boil them in a kettle. Then they throw a leaf into it, which by getting flaccid and burned is to them a sign of the boiling of the mixture. When the boiling is at its height, they throw a piece of gold into the kettle and order the defendant to fetch it out with his hand. If he has spoken the truth, he fetches it out.

The highest kind of ordeal is the following: They make a piece of iron so hot that it is near melting, and put it with a pair of tongs on the hand of the defendant, there being nothing between his hand and the iron save a broad leaf of some plant, and under it some few and scattered corns of rice in the husks. They order him to carry it seven paces, and then he may throw it to the ground.
CHAPTER LXXI.

ON PUNISHMENTS AND EXPIATIONS.

In this regard the manners and customs of the Hindus resemble those of the Christians, for they are, like those of the latter, based on the principles of virtue and abstinence from wickedness, such as never to kill under any circumstance whatsoever, to give to him who has stripped you of your coat also your shirt, to offer to him who has beaten your cheek the other cheek also, to bless your enemy and to pray for him. Upon my life, this is a noble philosophy; but the people of this world are not all philosophers. Most of them are ignorant and erring, who cannot be kept on the straight road save by the sword and the whip. And, indeed, ever since Constantine the Victorious became a Christian, both sword and whip have ever been employed, for without them it would be impossible to rule.

India has developed in a similar way. For the Hindus relate that originally the affairs of government and war were in the hands of the Brahmans, but the country became disorganised, since they ruled according to the philosophic principles of their religious codes, which proved impossible when opposed to the mischievous and perverse elements of the populace. They were even near losing also the administration of their religious affairs. Therefore they humiliated themselves before the lord of their religion. Whereupon Brahman in-Page 231. trusted them exclusively with the functions which they now have, whilst he intrusted the Kshatriyas with the

Vol. II.
duties of ruling and fighting. Ever since the Brahmans live by asking and begging, and the penal code is exercised under the control of the kings, not under that of the scholars.

The law about murder is this: If the murderer is a Brahman, and the murdered person a member of another caste, he is only bound to do expiation consisting of fasting, prayers, and almsgiving.

If the murdered person is a Brahman, the Brahman murderer has to answer for it in a future life; for he is not allowed to do expiation, because expiation wipes off the sin from the sinner, whilst nothing can wipe off any of the mortal crimes from a Brahman, of which the greatest are: the murder of a Brahman, called vajra-brahmahatyā; further, the killing of a cow, the drinking of wine, whoredom, especially with the wife of one's own father and teacher. However, the kings do not for any of these crimes kill a Brahman or Kshatriya, but they confiscate his property and banish him from their country.

If a man of a caste under those of the Brahman and Kshatriya kills a man of the same caste, he has to do expiation, but besides the kings inflict upon him a punishment in order to establish an example.

The law of theft directs that the punishment of the thief should be in accordance with the value of the stolen object. Accordingly, sometimes a punishment of extreme or of middling severity is necessary, sometimes a course of correction and imposing a payment, sometimes only exposing to public shame and ridicule. If the object is very great, the kings blind a Brahman and mutilate him, cutting off his left hand and right foot, or the right hand and left foot, whilst they mutilate a Kshatriya without blinding him, and kill thieves of the other castes.

An adulteress is driven out of the house of the husband and banished.

I have repeatedly been told that when Hindu slaves
(in Muslim countries) escape and return to their country and religion, the Hindus order that they should fast by way of expiation, then they bury them in the dung, stale, and milk of cows for a certain number of days, till they get into a state of fermentation. Then they drag them out of the dirt and give them similar dirt to eat, and more of the like.

I have asked the Brahmans if this is true, but they deny it, and maintain that there is no expiation possible for such an individual, and that he is never allowed to return into those conditions of life in which he was before he was carried off as a prisoner. And how should that be possible? If a Brahman eats in the house of a Śādra for sundry days, he is expelled from his caste and can never regain it.
CHAPTER LXXII.

ON INHERITANCE, AND WHAT CLAIM THE DECEASED PERSON HAS ON IT.

The chief rule of their law of inheritance is this, that the women do not inherit, except the daughter. She gets the fourth part of the share of a son, according to a passage in the book Manu. If she is not married, the money is spent on her till the time of her marriage, and her dowry is bought by means of her share. Afterwards she has no more income from the house of her father.

If a widow does not burn herself, but prefers to remain alive, the heir of her deceased husband has to provide her with nourishment and clothing as long as she lives.

The debts of the deceased must be paid by his heir, either out of his share or of the stock of his own property, no regard being had whether the deceased has left any property or not. Likewise he must bear the just-mentioned expenses for the widow in any case whatsoever.

As regards the rule about the male heirs, evidently the descendants, i.e. the son and grandson, have a nearer claim to the inheritance than the ascendants, i.e. the father and grandfather. Further, as regards the single relatives among the descendants as well as the ascendants, the nearer a man is related, the more claim he has on inheriting. Thus a son has a nearer claim than a grandson, a father than a grandfather.

The collateral relations, as, e.g. the brothers, have less
claim, and inherit only in case there is nobody who has a better claim. Hence it is evident that the son of a daughter has more claim than the son of a sister, and that the son of a brother has more claim than either of them.

If there are several claimants of the same degree of relationship, as, e.g., sons or brothers, they all get equal shares. A hermaphrodite is reckoned as a male being.

If the deceased leaves no heir, the inheritance falls to the treasury of the king, except in the case that the deceased person was a Brahman. In that case the king has no right to meddle with the inheritance, but it is exclusively spent on almsgiving.

The duty of the heir towards the deceased in the first year consists in his giving sixteen banquets, where every guest in addition to his food receives alms also, viz. on the fifteenth and sixteenth days after death; further, once a month during the whole year. The banquet in the sixth month must be more rich and more liberal than the others. Further, on the last but one day of the year, which banquet is devoted to the deceased and his ancestors; and finally, on the last day of the year. With the end of the year the duties towards the deceased have been fulfilled.

If the heir is a son, he must during the whole year wear mourning dress; he must mourn and have no intercourse with women, if he is a legitimate child and of a good stock. Besides, you must know that nourishment is forbidden to the heirs for one single day in the first part of the mourning-year.

Besides the almsgiving at the just-mentioned sixteen banquets, the heirs must make, above the door of the house, something like a shelf projecting from the wall in the open air, on which they have every day to place a dish of something cooked and a vessel of water, till the end of ten days after the death. For possibly the spirit of the deceased has not yet found its rest, but
moves still to and fro around the house, hungry and thirsty.

A similar view is indicated by Plato in *Phaedo*, where he speaks of the soul circling round the graves, because possibly it still retains some vestiges of the love for the body. Further he says: "People have said regarding the soul that it is its habit to combine something coherent out of the single limbs of the body, which is its dwelling in this as well as in the future world, when it leaves the body, and is by the death of the body separated from it."

On the tenth of the last-mentioned days, the heir spends, in the name of the deceased, much food and cold water. After the eleventh day, the heir sends every day sufficient food for a single person and a *dirham* to the house of the Brahman, and continues doing this during all the days of the mourning-year without any interruption until its end.
CHAPTER LXXIII.

ABOUT WHAT IS DUE TO THE BODIES OF THE DEAD AND OF THE LIVING (i.e. ABOUT BURYING AND SUICIDE).

In the most ancient times the bodies of the dead were exposed to the air by being thrown on the fields without any covering; also sick people were exposed on the fields and in the mountains, and were left there. If they died there, they had the fate just mentioned; but if they recovered, they returned to their dwellings.

Thereupon there appeared a legislator who ordered Page 23. people to expose their dead to the wind. In consequence they constructed roofed buildings with walls of rails, through which the wind blew, passing over the dead, as something similar is the case in the grave-towers of the Zoroastrians.

After they had practised this custom for a long time, Nārāyaṇa prescribed to them to hand the dead over to the fire, and ever since they are in the habit of burning them, so that nothing remains of them, and every defilement, dirt, and smell is annihilated at once, so as scarcely to leave any trace behind.

Nowadays the Slavonians, too, burn their dead, whilst the ancient Greeks seem to have had both customs, that of burning and that of burying. Socrates speaks in the book *Phaedo*, after Crito had asked him in what manner he wanted to be buried: “As you wish, when you make arrangements for me. I shall not flee from you.” Then he spoke to those around him: “Give to Crito regarding myself the opposite guarantee of that
which he has given to the judges regarding myself; for he guaranteed to them that I should stay, whilst you now must guarantee that I shall not stay after death. I shall go away, that the look of my body may be tolerable to Crito when it is burned or buried, that he may not be in agony, and not say: 'Socrates is carried away, or is burned or buried.' Thou, O Crito, be at ease about the burial of my body. Do as thou likest, and specially in accordance with the laws.”

Galenus says in his commentary to the apothegms of Hippocrates: “It is generally known that Asclepius was raised to the angels in a column of fire, the like of which is also related with regard to Dionysos, Heracles, and others, who laboured for the benefit of mankind. People say that God did thus with them in order to destroy the mortal and earthly part of them by the fire, and afterwards to attract to himself the immortal part of them, and to raise their souls to heaven.”

In these words, too, there is a reference to the burning as a Greek custom, but it seems to have been in use only for the great men among them.

In a similar way the Hindus express themselves. There is a point in man by which he is what he is. This point becomes free when the mixed elements of the body are dissolved and scattered by combustion.

Regarding this return (of the immortal soul to God), the Hindus think that partly it is effected by the rays of the sun, the soul attaching itself to them and ascending with them, partly by the flame of the fire, which raises it (to God). Some Hindu used to pray that God would make his road to himself as a straight line, because this is the nearest road, and that there is no other road upwards save the fire or the ray.

Similar to this is the practice of the Ghuzz Turks with reference to a drowned person; for they place the body on a bier in the river, and make a cord hang down
from his foot, throwing the end of the cord into the water. By means of this cord the spirit of the deceased is to raise himself for resurrection.

The belief of the Hindus on this head was confirmed by the words of Vāsudeva, which he spoke regarding the sign of him who is liberated from the fetters (of bodily existence). "His death takes place during uttāndayana (i.e. the northern revolution of the sun from the winter solstice to the summer solstice), during the white half of the month, between lighted lamps, i.e. between conjunction and opposition (new moon and full moon), in the seasons of winter and spring."

A similar view is recognised in the following words of Māni: "The other religious bodies blame us because we worship sun and moon, and represent them as an image. But they do not know their real natures; they do not know that sun and moon are our path, the door whence we march forth into the world of our existence (into heaven), as this has been declared by Jesus." So he maintains.

People relate that Buddha had ordered the bodies of the dead to be thrown into flowing water. Therefore his followers, the Shamanians, throw their dead into the rivers.

According to the Hindus, the body of the dead has the claim upon his heirs that they are to wash, embalm, wrap it in a shroud, and then to burn it with as much sandal and other wood as they can get. Part of his burned bones are brought to the Ganges and thrown into it, that the Ganges should flow over them, as it has flowed over the burned bones of the children of Sāgara, thereby forcing them from hell and bringing them into paradise. The remainder of the ashes is thrown into some brook of running water. On the spot where the body has been burned they raise a monument similar to a milestone, plastered with gypsum.
The bodies of children under three years are not burned.

Those who fulfil these duties towards the dead afterwards wash themselves as well as their dresses during two days, because they have become unclean by touching the dead.

Those who cannot afford to burn their dead will either throw them somewhere on the open field or into running water.

Now as regards the right of the body of the living, the Hindus would not think of burning it save in the case of a widow who chooses to follow her husband, or in the case of those who are tired of their life, who are distressed over some incurable disease of their body, some irremovable bodily defect, or old age and infirmity. This, however, no man of distinction does, but only Vaiśyas and Śūdras, especially at those times which are prized as the most suitable for a man to acquire in them, for a future repetition of life, a better form and condition than that in which he happens to have been born and to live. Burning oneself is forbidden to Brahmans and Kshatriyas by a special law. Therefore these, if they want to kill themselves, do so at the time of an eclipse in some other manner, or they hire somebody to drown them in the Ganges, keeping them under water till they are dead.

At the junction of the two rivers, Yamunā and Ganges, there is a great tree called Prayāga, a tree of the species called vata. It is peculiar to this kind of tree that its branches send forth two species of twigs, some directed upward, as is the case with all other trees, and others directed downward like roots, but without leaves. If such a twig enters into the soil, it is like a supporting column to the branch whence it has grown. Nature has arranged this on purpose, since the branches of this tree are of an enormous extent (and require to be supported). Here the Brahmans and Kshatriyas are in
the habit of committing suicide by climbing up the tree and throwing themselves into the Ganges.

Johannes Grammaticus relates that certain people in ancient Greek heathendom, "whom I call the worshippers of the devil"—so he says—used to beat their limbs with swords, and to throw themselves into the fire, without feeling any pain therefrom.

As we have related this as a view of the Hindus not to commit suicide, so also Socrates speaks: "Likewise it does not become a man to kill himself before the gods give him a cause in the shape of some compulsion or dire necessity, like that in which we now are."

Further he says: "We human beings are, as it were, in a prison. It does not behave us to flee nor to free ourselves from it, because the gods take notice of us, since we, the human beings, are servants to them."
CHAPTER LXXIV.

ON FASTING, AND THE VARIOUS KINDS OF IT.

Fasting is with the Hindus voluntary and supererogatory. Fasting is abstaining from food for a certain length of time, which may be different in duration and in the manner in which it is carried out.

The ordinary middle process, by which all the conditions of fasting are realised, is this: A man determines the day on which he will fast, and keeps in mind the name of that being whose benevolence he wishes to gain thereby and for whose sake he will fast, be it a god, or an angel, or some other being. Then he proceeds, prepares (and takes) his food on the day before the fast-day at noon, cleans his teeth by rubbing, and fixes his thoughts on the fasting of the following day. From that moment he abstains from food. On the morning of the fast-day he again rubs his teeth, washes himself, and performs the duties of the day. He takes water in his hand, and sprinkles it into all four directions, he pronounces with his tongue the name of the deity for whom he fasts, and remains in this condition till the day after the fast-day. After the sun has risen, he is at liberty to break the fast at that moment if he likes, or, if he prefers, he may postpone it till noon.

This kind is called *upavatso*, i.e. the fasting; for the not-eating from one noon to the following is called *ekanakta*, not fasting.

Another kind, called *kricchra*, is this: A man takes his food on some day at noon, and on the following day
in the evening. On the third day he eats nothing except what by chance is given him without his asking for it. On the fourth day hefasts.

Another kind, called pada, is this: A man takes his food at noon on three consecutive days. Then he transfers his eating-hour to the evening during three further consecutive days. Then he fasts uninterruptedly during three consecutive days without breaking fast.

Another kind, called candrayana, is this: A manfasts on the day of full moon; on the following day he takes only a mouthful, on the third day he takes double this amount, on the fourth day the threefold of it, &c., &c., going on thus till the day of new moon. On that day he fasts; on the following days he again diminishes his food by one mouthful a day, till he again fasts on the day of full moon.

Another kind, called masadas (masopadasa), is this: A man uninterruptedly fasts all the days of a month without ever breaking fast.

The Hindus explain accurately what reward the latter fasting in every single month will bring to a man for a new life of his after he has died. They say:

If a man fasts all the days of Caitra, he obtains wealth and joy over the nobility of his children.

If he fasts Vaisakha, he will be a lord over his tribe and great in his army.

If he fasts Jyaishtha, he will be a favourite of the women.

If he fasts Ashadhya, he will obtain wealth.

If he fasts Shravana, he obtains wisdom.

If he fasts Bhadrapada, he obtains health and valour, riches and cattle.

If he fasts Ashvayuja, he will always be victorious over his enemies.

If he fasts Karttika, he will be grand in the eyes of people and will obtain his wishes.
If he fasts Mārgasīrtha, he will be born in the most beautiful and fertile country.
If he fasts Pausha, he obtains a high reputation.
If he fasts Māgha, he obtains innumerable wealth.
If he fasts Phālguna, he will be beloved.

He, however, who fasts during all the months of the year, only twelve times breaking the fast, will reside in paradise 10,000 years, and will thence return to life as the member of a noble, high, and respected family.

The book Vishnu-Dharma relates that Maitreyi, the wife of Yājnāvalkya, asked her husband what man is to do in order to save his children from calamities and bodily defects, upon which he answered: "If a man begins on the day Duvē, in the month Pausha, i.e. the second day of each of the two halves of the month, and fasts four consecutive days, washing himself on the first with water, on the second with sesame oil, on the third with galangale, and on the fourth with a mixture of various balms; if he further on each day gives alms and recites praises over the names of the angels; if he continue to do all this during each month till the end of the year, his children will in the following life be free from calamities and defects, and he will obtain what he wishes; for also Dīlīpa, Dushyanta, and Yaydī obtained their wishes for having acted thus."
CHAPTER LXXV.

ON THE DETERMINATION OF THE FAST-DAYS.

The reader must know in general that the eighth and eleventh days of the white half of every month are fast-days, except in the case of the leap month, for it is disregarded, being considered unlucky.

The eleventh is specially holy to Vasudeva, because on having taken possession of Mahura, the inhabitants of which formerly used to worship Indra one day in each month, he induced them to transfer this worship to the eleventh, that it should be performed in his name. As the people did so, Indra became angry and poured rains over them like deluges, in order to destroy both them and their cattle. Vasudeva, however, raised a mountain by his hand and protected them thereby. The water collected round them, but not above them, and the image of Indra fled. The people commemorated this event by a monument on a mountain in the neighbourhood of Mahura. Therefore they fast on this day in the state of the most punctilious cleanliness, and they stay awake all the night, considering this as an obligatory performance, though in reality it is not obligatory.

The book Vishnu-Dharma says: "When the moon is in Rohini, the fourth of her stations, on the eighth day of the black half, it is a fast-day called Jayanti. Giving alms on this day is an expiation for all sins."

Evidently this condition of the fast-day does not in general apply to all months, but in particular only to Bhadrapada, since Vasudeva was born in this month
and on this day, whilst the moon stood in the station Rohini. The two conditions, viz. the moon's standing in Rohini and that the day is the eighth of the black half, can happen only once in so and so many years, for various reasons, e.g. the intercalation of the year, and because the civil years do not keep pace with lunar time, either getting in advance of it or falling behind.

The same book says: "When the moon stands in Purarvasu, the seventh of her stations, on the eleventh day of the white half of the month, this is a fast-day, called Ati (? Aṭṭāṭāja). If a man does works of piety on this day, he will be enabled to obtain whatever he wishes, as has been the case with Sagara, Kakustha, and Dandahamdr (?), who obtained royalty because they had done so.

The sixth day of Caitra is a fast-day holy to the sun.

In the month Āshāḍha, when the moon stands in Anurādhā, the seventeenth of her signs, there is a fast-day holy to Vāsudeva called Devastī (?), i.e. Deva is sleeping, because it is the beginning of the four months during which Vāsudeva slept. Others add this condition, that the day must be the eleventh of the month.

It is evident that such a day does not occur in every year. The followers of Vāsudeva abstain on this day from meat, fish, sweetmeats, and cohabitation with the women, and take food only once a day. They make the earth their bed without any covering, and do not use a bedstead raised above the earth.

People say that these four months are the night of the angels, to which must be added a month at the beginning as evening twilight, and a month at the end as morning dawn. However, the sun stands then near 0° of Cancer, which is noon in the day of the angels, and I do not see in what way this moon is connected with the two Samdhis.

The day of full moon in the month Śrāvana is a fast-day holy to Somanātha.
CHAPTER LXXV.

When in the month Āsvayuja the moon stands in Alsharaṭān (the lunar station) and the sun is in Virgo, it is a fast-day.

The eighth of the same month is a fast-day holy to Bhagavatī. Fasting is broken when the moon rises.

The fifth day of Bhādrapada is a fast-day holy to the sun, called śaṭ. They anoint the solar rays, and in particular those rays which enter through the windows, with various kinds of balsamic ointments, and place upon them odoriferous plants and flowers.

When in this month the moon stands in Rohiṇī, it is a fast-day for the birth of Vāsudeva. Others add, besides, the condition that the day must be the eighth of the black half. We have already pointed out that such a day does not occur in every year, but only in certain ones of a larger number of years.

When in the month Kārttika the moon stands in Revati, the last of her stations, it is a fast-day in commemoration of the waking up of Vāsudeva. It is called deotthiṇī, i.e. the rising of the Deva. Others add, besides, the condition that it must be the eleventh of the white half. On that day they soil themselves with the dung of cows, and break fasting by feeding upon a mixture of cow's milk, urine, and dung. This day is the first of the five days which are called Bhūshma pañcaraḍtri. They fast during them in honour of Vāsudeva. On the second of them the Brahmans break fasting, after them the others.

On the sixth day of Pausha is a fasting in honour of the sun.

On the third day of Māgha there is a fasting for the women, not for the men. It is called Gaur-t-r (gaur-t-trītyaḥ), and lasts the whole day and night. On the following morning they make presents to the nearest relatives of their husbands.
CHAPTER LXXVI.

ON THE FESTIVALS AND FESTIVE DAYS.

Yāṭra means travelling under auspicious circumstances. Therefore a feast is called yāṭra. Most of the Hindu festivals are celebrated by women and children only.

The 2nd of the month Caitra is a festival to the people of Kashmir, called Aṛḍas (?), and celebrated on account of a victory gained by their king, Muttai, over the Turks. According to their account he ruled over the whole world. But this is exactly what they say of most of their kings. However, they are incautious enough to assign him to a time not much anterior to our time, which leads to their lie being found out. It is, of course, not impossible that a Hindu should rule (over a huge empire), as Greeks, Romans, Babylonians, and Persians have done, but all the times not much anterior to our own are well known. (If, therefore, such had been the case, we should know it.) Perhaps the here mentioned king ruled over the whole of India, and they know of no other country but India and of no other nations but themselves.

On the 11th there is a festival called Hindola-caitra, when they meet in the devagriha, or temple of Vāṣudeva, and swing his image to and fro, as had been done with him when he was an infant in the cradle. They perform the same in their houses during the whole day and make merry.

On the full moon's day of Caitra there is a feast called Bahand (vasanta ?), a festival for the women,
when they put on their ornaments and demand presents from their husbands.

The 22nd is a festival called caitra-cashati, a day of Caïtra merriment holy to Bhagavati, when people use to wash and to give alms.

The 3rd Vaisākha is a festival for the women called Gaurī-trītya (?), holy to Gaurī, the daughter of the mountain Himavant, the wife of Mahādeva. They wash and dress gaily, they worship the image of Gaurī and light lamps before it, they offer perfumes, abstain from eating, and play with swings. On the following day they give alms and eat.

On the 10th Vaisākha all the Brahmins whom the kings have invited proceed forth to the open fields, and there they light great fires for the sacrifices during five days till full moon. They make the fires in sixteen different spots and in four different groups. In each group a Brahman performs the sacrifice, so that there are four performing priests as there are four Vedas. On the 16th they return home.

In this month occurs the vernal equinox, called vasanta. They determine the day by calculation and make it a festival, when people invite the Brahmins.

On the 1st Jyaistha, or new moon’s day, they celebrate a festival and throw the firstfruits of all seeds into the water in order to gain thereby a favourable prognostic.

The full moon’s day of this month is a festival to the women, called ṛḍa-pānca (?).

All the days of the month Āśāḍha are devoted to Āśāḍha alms-giving. It is also called āhārya. During this time the household is provided with new vessels.

On the full moon’s day of Srāvana they give banquets to the Brahmins.

On the 8th Āṣāyuja, when the moon stands in the 8th Āṣāyuja nineteenth station, Mūla, begins the sucking of the sugar cane. It is a festival holy to Mahānavamī, the
sister of Mahâdeva, when they offer the firstfruits of sugar and all other things to her image which is called Bhagavati. They give much alms before it and kill kids. He who does not possess anything to offer, stands upright by the side of the idol, without ever sitting down, and will sometimes pounce upon whomsoever he meets and kill him.

On the 15th, when the moon stands in the last of her stations, Revatt, there is the festival Pukât (?), when they wrangle with each other and play with the animals. It is holy to Vásudeva, because his uncle Kamsa had ordered him into his presence for the purpose of wrangling.

On the 16th there is a festival, when they give alms to the Brahmans.

On the 23rd is the festival Aśoka, also called Āhôt, when the moon stands in the seventh station, Punarvasu. It is a day of merriment and of wrangling.

In the month Bhâdrapadâ, when the moon stands in the tenth station, Maghâ, they celebrate a festival which they call pitripaksha, i.e. the half of the month of the Fathers, because the moon’s entering this station falls near the time of new moon. They distribute alms during fifteen days in the name of the Fathers.

On the 3rd Bhâdrapadâ is the festival Harbâlt (?), for the women. It is their custom that a number of days before they sow all kinds of seeds in baskets, and they bring the baskets forward on this day after they have commenced growing. They throw roses and perfumes on them and play with each other during the whole night. On the following morning they bring them to the ponds, wash them, wash themselves, and give alms.

On the 6th of this month, which is called Gâikat (?), when people give food to those who are in prison.

On the 8th, when the moonlight has reached half of its development, they have a festival called dhrvâ-
griha (?); they wash themselves and eat well growing grain-fruit that their children should be healthy. The women celebrate this festival when they are pregnant and desire to have children.

The 11th Bhādrapadā is called Parvatt(?). This is the name of a thread which the priest makes from materials presented to him for the purpose. One part of it he dyes with crocus, the other he leaves as it is. He gives the thread the same length as the statue of Vāsudeva is high. Then he throws it over his neck, so that it hangs down to his feet. It is a much venerated festival.

The 16th, the first day of the black half, is the first of seven days which are called karāra (?), when they adorn the children nicely and give a treat to them. They play with various animals. On the seventh day the men adorn themselves and celebrate a festival. And during the rest of the month they always adorn the children towards the end of the day, give alms to the Brahmins, and do works of piety.

When the moon stands in her fourth station, Rohini, they call this time Gāndhārā (?), celebrating a festival during three days and making merry by playing with each other, from joy over the birth of Vāsudeva.

Jīvaśārmān relates that the people of Kashmir celebrate a festival on the 26th and 27th of this month, on account of certain pieces of wood called gana (?), which the water of the river Vitastā (Jailam) carries, in those two days, through the capital, Adhishṭhāna. People maintain that it is Mahādeva who sends them. It is peculiar to these pieces of wood, so they say, that nobody is able to seize them, however much he may desire it, that they always evade his grasp and move away.

However, the people of Kashmir, with whom I have conversed on the subject, give a different statement as to the place and the time, and maintain that the thing occurs in a pond called Kādaishahr (?), to the left of the
source of the just-mentioned river (Vitastâ-Jailam), in the middle of the month Vaisâkha. The latter version is the more likely, as about this time the waters begin to increase. The matter reminds one of the wood in the river of Jurjân, which appears at the time when the water swells in its source.

The same Jivaśarman relates that in the country of Svât, opposite the district of Kârâ (?), there is a valley in which fifty-three streams unite. It is called Tranjîti (cf. Sindhi trâvanjîth). In those two days the water of this valley becomes white, in consequence of Mahâ-deva's washing in it, as people believe.

The 1st Kârttiika, or new moon's day, when the sun marches in Libra, is called Dibali. Then people bathe, dress festively, make presents to each other of betel-leaves and areca-nuts; they ride to the temples to give alms and play merrily with each other till noon. In the night they light a great number of lamps in every place so that the air is perfectly clear. The cause of this festival is that Lakshmi, the wife of Vâsudeva, once a year on this day liberates Bali, the son of Virocana, who is a prisoner in the seventh earth, and allows him to go out into the world. Therefore the festival is called Balîrdja, i.e. the principality of Bali. The Hindus maintain that this time was a time of luck in the Kritayuga, and they are happy because the feast-day in question resembles that time in the Kritayuga.

In the same month, when full moon is perfect, they give banquets and adorn their women during all the days of the black half.

The 3rd Mârgasîraha, called Guvâna-bdirî (— tri-tyād ?), is a feast of the women, sacred to Gaurî. They meet in the houses of the rich among them; they put several silver statues of the goddess on a throne, and perfume it and play with each other the whole day. On the following morning they give alms.
On full moon’s day of the same month there is another festival of the women.

On most of the days of the month Pausha they prepare great quantities of pdhaval (?), i.e. a sweet dish which they eat.

On the eighth day of the white half of Pausha, which is called Ashåka, they make gatherings of the Brahmans, present them with dishes prepared from the plant Atriplex hortensis, i.e. sarmåk in Arabic (= orache), and show attentions to them.

On the eighth day of the black half, which is called Såkatam, they eat turnips.

The 3rd Mågha, called Måhatry (Mågha-tritbyd ?), is a feast for the women, and sacred to Gauri. They meet in the houses of the most prominent among them before the image of Gauri, place before it various sorts of costly dresses, pleasant perfumes, and nice dishes. In each meeting-place they put 108 jugs full of water, and after the water has become cool, they wash with it four times at the four quarters of that night. On the following day they give alms, they give banquets and receive guests. The women’s washing with cold water is common to all the days of this month.

On the last day of this month, i.e. the 29th, when there is only a remainder of 3 day-minutes, i.e. 1½ hour, all the Hindus enter the water and duck under in it seven times.

On the full moon’s day of this month, called cåmåha, they light lamps on all high places.

On the 23rd, which is called månsartaku, and also mådhåtan, they receive guests and feed them on meat and large black peas.

On the 8th Phålguna, called pårårtaku, they prepare for the Brahmans various dishes from flour and butter.

The full moon’s day of Phålguna is a feast to the women, called Oddå (?), or also dhola (i.e. dola), when...
they make fire on places lower than those on which they make it on the festival ādāka, and they throw the fire out of the village.

On the following night, i.e. that of the 16th, called Śivarātri, they worship Mahādeva during the whole night; they remain awake, and do not lie down to sleep, and offer to him perfumes and flowers.

On the 23rd, which is called pāvattan (?), they eat rice with butter and sugar.

The Hindus of Māltān have a festival which is called Śambapurayādṛś; they celebrate it in honour of the sun, and worship him. It is determined in this way: They first take the ahargana, according to the rules of Khaṇḍakhādyaka, and subtract 98,040 therefrom. They divide the remainder by 365, and disregard the quotient. If the division does not give a remainder, the quotient is the date of the festival in question. If there is a remainder, it represents the days which have elapsed since the festival, and by subtracting these days from 365 you find the date of the same festival in the next following year.
CHAPTER LXXVII.

ON DAYS WHICH ARE HELD IN SPECIAL VENERATION, ON LUCKY AND UNLUCKY TIMES, AND ON SUCH TIMES AS ARE PARTICULARLY FAVOURABLE FOR ACQUIRING IN THEM BLISS IN HEAVEN.

The single days enjoy different degrees of veneration according to certain qualities which they attribute to them. They distinguish, e.g., the Sunday, because it is the day of the sun and the beginning of the week, as the Friday is distinguished in Islam.

To the distinguished days further belong *omādāsyaḥ* and *pūrṇimaḥ*, i.e. the days of conjunction (new moon) and opposition (full moon), because they are the limits of the wane and the increase of the moonlight. In accordance with the belief of the Hindus regarding this increase and wane, the Brahmans sacrifice continually to the fire in order to earn heavenly reward. They let the portions of the angels accumulate, which are the offerings thrown into the fire at moonlight during the whole time from new moon to full moon. Then they begin distributing these portions over the angels in the time from full moon to new moon, till at the time of new moon nothing any more remains of them. We have already mentioned that new moon and full moon are noon and midnight of the nycithemeron of the Fathers. Therefore the uninterrupted almsgiving on these two days is always done in honour of the Fathers.
Four other days are held in special veneration, because, according to the Hindus, with them the single yugas of the present caturyuga have commenced, viz.:—

The 3rd Vaisakha, called kshaarita (?), on which the Krita-yuga is believed to have commenced.

The 9th Kárttika, the beginning of the Tretá-yuga.

The 15th Māgha, the beginning of the Dvāpara-yuga.

The 13th of Áśvayuja, the beginning of the Kali-yuga.

According to my opinion, these days are festivals, sacred to the yugas, instituted for the purpose of almsgiving or for the performance of some rites and ceremonies, as, e.g., the commemoration-days in the year of the Christians. However, we must deny that the four yugas could really have commenced on the days here mentioned.

With regard to the Krita-yuga, the matter is perfectly clear, because its beginning is the beginning of the solar and lunar cycles, there being no fraction in the date, since it is, at the same time, the beginning of the caturyuga. It is the first of the month Caitra, at the same time the date of the vernal equinox, and on the same day also the other yugas commence. For, according to Brahmagupta, a caturyuga contains:—

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil days</td>
<td>1,577,916,450</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar months</td>
<td>51,840,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leap months</td>
<td>1,593,300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunar days</td>
<td>1,602,999,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ānaratra days</td>
<td>25,082,350</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These are the elements on which the resolution of chronological dates into days, or the composition of them out of days, is based. All these numbers may be divided by 10, and the divisors are wholes without any fraction. Now the beginnings of the single yugas depend upon the beginning of the caturyuga.
According to Pulisa the *caturyuga* contains:—

| Civil days | ... | ... | ... | 1,577,917,800 |
| Solar months | ... | ... | ... | 51,840,000 |
| Leap months | ... | ... | ... | 1,593,336 |
| Lunar days | ... | ... | ... | 1,603,000,010 |
| *Unārdra* days | ... | ... | ... | 25,082,280 |

All these numbers may be divided by 4, and the divisors are wholly without any fraction. According to this computation, also, the beginnings of the single *yugas* are the same as the beginning of the *caturyuga*, *i.e.* the first of the month Caitra and the day of the vernal equinox. However, this day falls on different week days.

Hence it is evident that their theory about the above-mentioned four days being the beginnings of the four *yugas*, is without any foundation at all; that they could never arrive at such a result unless by resorting to very artificial ways of interpretation.

The times which are specially favourable to earn a heavenly reward in them are called *punyakāla*. Bala-bhadra says in his commentary to the Khandakhaṇḍyaka:—"If the *yogin*, *i.e.* the ascetic who understands the creator, who chooses the good and eschews the bad, continued his manner of life during one thousand years, his reward would not be equal to that of a man who gives alms on *punyakāla* and fulfils the duties of the day, *i.e.* washing and anointing himself, saying prayers and praises."

No doubt, most of the feast-days enumerated in the preceding belong to this kind of days, for they are devoted to almsgiving and banqueting. If people did not expect to gain thereby a reward in heaven, they would not approve of the rejoicings and merriments which are characteristic of these days.

Notwithstanding the nature of the *punyakāla* is such as here explained, some of them are considered as lucky, others as unlucky days.
Those days are lucky when the planets migrate from one sign into the other, especially the sun. These times are called samkranti. The most propitious of them are the days of the equinoxes and solstices, and of these the most propitious is the day of the vernal equinox. It is called bīkha or shibă (vishuva), as the two sounds sh and kh may be exchanged for each other, and may also, by a metathesis, change their place.

As, however, a planet’s entering a new sign does not require more than a moment of time, and, during it, people must offer to the fire the offering sānta (?) with oil and corn, the Hindus have given a greater extent to these times, making them begin with the moment when the eastern edge of the body of the sun touches the first part of the sign; reckoning as their middle the moment when the sun’s centre reaches the first part of the sign, which is in astronomy considered as the time of the migration (of the planet from one sign to the other), and reckoning as the end that moment when the western edge of the sun’s body touches the first part of the sign. This process lasts, in the case of the sun, nearly two hours.

For the purpose of finding the times in the week when the sun migrates from one sign to another, they have several methods, one of which was dictated to me by Samaya (?). It is this:—

Subtract from the Śakakāla 847, multiply the remainder by 180, and divide the product by 143. The quotient you get represents days, minutes, and seconds. This number is the basis.

If you want to know at what time in the year in question the sun enters any one of the twelve signs, you look out the sign in the following table. Take the number which you find side by side with the sign in question, and add it to the basis, days to days, minutes to minutes, seconds to seconds. If the wholes amount to 7 or more, disregard them, and with the remainder
count off the week-days, beginning with the beginning of Sunday. That time you arrive at is the moment of saṃkrānti.

<table>
<thead>
<tr>
<th>The Zodiacal Signs</th>
<th>Days</th>
<th>Ghaṭi</th>
<th>Cashaka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aries</td>
<td>3</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>Taurus</td>
<td>6</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Gemini</td>
<td>2</td>
<td>43</td>
<td>0</td>
</tr>
<tr>
<td>Cancer</td>
<td>8</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Leo</td>
<td>2</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>Virgo</td>
<td>5</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>Libra</td>
<td>1</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Scorpio</td>
<td>4</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Ariesenens</td>
<td>5</td>
<td>34</td>
<td>30</td>
</tr>
<tr>
<td>Capricornus</td>
<td>5</td>
<td>54</td>
<td>0</td>
</tr>
<tr>
<td>Amphora</td>
<td>0</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>Pisces</td>
<td>2</td>
<td>11</td>
<td>20</td>
</tr>
</tbody>
</table>

The beginning of consecutive solar years in the week differs by 1 day and the fraction at the end of the year. This amount, reduced to fractions of one kind, is the multiplicator (180), used in the preceding computation in order to find the surplus of each year (i.e. the amount by which its beginning wanders onward through the week).

The divisor (143) is the denominator of the fraction (which is accordingly $\frac{180}{143}$).

Accordingly the fraction at the end of the solar year is, in this computation, reckoned as $\frac{27}{143}$, which implies as the length of the solar year, 365 days 15' 31" 28'' 6''. To raise this fraction of a day to one whole day, $\frac{143}{143}$ of a day are required. I do not know whose theory this is.

If we divide the days of a caturyga by the number of its solar years, according to the theory of Brahmagupta, we get as the length of the solar year, 365 days 30' 22'' 30'' 0''. In this case the multiplicator or gunakāra is 4027, and the divisor or bhāgahāra is 3200 (i.e. 1 day 30' 22'' 30'' 0'' are equal to $\frac{4027}{3200}$).
Reckoning according to the theory of Pulisa, we find as the length of the solar year 365 days 15' 31" 30" 0th. Accordingly, the gunakātra would be 1007, the bhagakātra 800 (i.e. 1 day 15' 31" 30" 0th are equal to $\frac{1007}{800}$).

According to Āryabhaṭa, the length of the solar year is 365 days 15' 31" 15". In that case the gunakātra is 725 and the bhagakātra is 572 (i.e. 1 day 15' 31" 15" are equal to $\frac{725}{572}$).

Another method for finding the moment of samkrānti has been dictated to me by Auliatta (?), the son of Sa-kāwē (?), and is based on the system of Pulisa. It is this:

Subtract from the Sakākāla 918, multiply the remainder by 1007, add to the product 79, and divide the sum by 800. Divide the quotient by 7. The remainder you get is the basis. What now must for each sign be added to the basis, as has already been mentioned (ii. 188), is indicated by the following table opposite to each sign:

<table>
<thead>
<tr>
<th>The Zodiacal Signs</th>
<th>What must be added to the Basis</th>
<th>The Zodiacal Signs</th>
<th>What must be added to the Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aries</td>
<td>1</td>
<td>Libra</td>
<td>6</td>
</tr>
<tr>
<td>Taurus</td>
<td>4</td>
<td>Scorpio</td>
<td>1</td>
</tr>
<tr>
<td>Gemini</td>
<td>0</td>
<td>Arcitenens</td>
<td>2</td>
</tr>
<tr>
<td>Cancer</td>
<td>4</td>
<td>Capricorn</td>
<td>4</td>
</tr>
<tr>
<td>Leo</td>
<td>1</td>
<td>Amphora</td>
<td>5</td>
</tr>
<tr>
<td>Virgo</td>
<td>4</td>
<td>Pisces</td>
<td>0</td>
</tr>
</tbody>
</table>

Varāhamihira maintains in the Pañcasiddhāntikā that the shadaśtimukha is in the same degree propitious as the time of samkrānti for acquiring in it infinite heavenly reward. This is the moment of the sun's entering:—The 18th degree of Gemini; the 14th degree of Virgo; the 26th degree of Arcitenens; and the 28th degree of Pisces.

The moment of the sun's entering the fixed signs
is four times as propitious as the moment of his entering the other signs. For each of these times they compute the beginning and the end by means of the radius of the sun in the same way as they compute the minutes of the sun's or moon's entering and leaving the shadow at an eclipse. This method is well known in their canones. We, however, communicate here only those of their methods of calculation which we think remarkable, or which, as far as we know, have not yet been explained before Muslim ears, as Muslims know of the methods of the Hindus only those which are found in the Sind-hind.

Most propitious times are, further, the times of solar and lunar eclipses. At that time, according to their belief, all the waters of the earth become as pure as that of the Ganges. They exaggerate the veneration of these times to such a degree that many of them commit suicide, wishing to die at such a time as promises them heavenly bliss. However, this is only done by Vaisyas and Sudras, whilst it is forbidden to Brahmins and Kshatriyas, who in consequence do not commit suicide (vide, however, ii. 170).

Further, the times of Parvan are propitious, i.e. those Parvan and yogas. times in which an eclipse may take place. And even if there is no eclipse at such a time, it is considered quite as propitious as the time of an eclipse itself.

The times of the yogas are as propitious as those of the eclipses. We have devoted a special chapter to them (chap. lxxix.).

If it happens within the course of one civil day that the moon revolves in the latter part of some station, then enters the following station, proceeds through the whole of it and enters a third station, so that in one single day she stands in three consecutive stations, such a day is called trihaspaka (?), and also triharkasha (?). Page 294. It is an unlucky day, boding evil, and it is counted among the punyakdla. (See ii. 187.)
The same applies to that civil day which comprehends a complete lunar day, whose beginning, besides, falls in the latter part of the preceding lunar day, and whose end falls in the beginning of the following lunar day. Such a day is called \textit{trahagattata} (?). It is unlucky, but favourable to earn in it a heavenly reward.

When the days of \textit{una[r]dra}, i.e. \textit{the days of the decrease} (see ii. 25), sum up so as to form one complete day, it is unlucky and reckoned among the \textit{punyakila}. This takes place according to Brahmagupta in \(62\frac{8}{10}\) civil days, \(62\frac{1}{10}\) solar days, \(63\frac{1}{10}\) lunar days.

According to Pulisa, it takes place in \(62\frac{3}{4}\) civil days, \(63\frac{3}{4}\) lunar days, \(62\frac{1}{4}\) solar days.

The moment when a complete leap-month without any fraction is summed up, is unlucky, and is not reckoned among the \textit{punyakala}. According to Brahmagupta, this takes place in \(990\frac{2}{3}\) civil days, \(976\frac{1}{3}\) solar days, \(1006\frac{2}{3}\) lunar days.

Times which are considered as unlucky, to which no merit whatsoever is attributed, are, \textit{e.g.}, the times of earthquakes. Then the Hindus beat with the pots of their households against the earth and break them, in order to get a good omen and to banish the mishap. As times of a similar ill nature, the book \textit{Samhita} further enumerates the moments of landslips, the falling of stars, red glow in the sky, the combustion of the earth by lightning, the appearance of comets, the occurrence of events contrary both to nature and custom, the entering of the wild beasts into the villages, rainfall when it is not the season for it, the trees putting forth leaves when it is not the season for it, when the nature of one season of the year seems transferred to another, and more of the like.

The book \textit{Sra\textacute{}dhava}, attributed to Mah\textacute{}deva, says the following:
"The burning days, i.e. the unlucky ones—for thus they call them—are:

"The second days of the white and black halves of the months Caitra and Pausha;

"The fourth days of the two halves of the months Jyaishtha and Phalguna;

"The sixth days of the two halves of the months Shravan and Vaisakha;

"The eighth days of the two halves of the months Ashada and Avasayuja;

"The tenth days of the two halves of the months Margasirsha and Bhadrapada;

"The twelfth days of the two halves of the month Karttika."
CHAPTER LXXVIII.

ON THE KARANAS.

We have already spoken of the lunar days called tithi, and have explained that each lunar day is shorter than a civil day, because the lunar month has thirty lunar days, but only a little more than twenty-nine and a half civil days.

As the Hindus call these tithis nychthemera, they also call the former half of a tithi day, the latter half night. Each of these halves has a separate name, and they all of them (i.e. all the halves of the lunar days of the lunar month) are called karanas.

Some of the names of the karanas occur only once in a month and are not repeated, viz. four of them about the time of new moon, which are called the fixed ones, because they occur only once in the month, and because they always fall on the same day and night of the month.

Others of them revolve and occur eight times in a month. They are called the movable ones, because of their revolving, and because each one of them may as well fall on a day as on a night. They are seven in number, and the seventh or last of them is an unlucky day, by which they frighten their children, the simple mention of which makes the hairs on the head of their boys stand on end. We have given an exhaustive description of the karanas in another book of ours. They are mentioned in every Indian book on astronomy and mathematics.
If you want to know the *karaṇas*, first determine the lunar days, and find out in what part of them the date in question falls, which is done in this way:

Subtract the corrected place of the sun from the corrected place of the moon. The remainder is the distance between them. If it is less than six zodiacal signs, the date falls in the white half of the month; if it is more, it falls in the black half.

Reduce this number to minutes, and divide the product by 720. The quotient represents *tithis*, i.e. complete lunar days. If you get by the division a remainder, multiply it by 60 and divide the product by the mean *bhūkti*. The quotient represents *ghafts* and minor fractions, i.e. that portion of the current day which has already elapsed.

This is the method of the *canones* of the Hindus. The distance between the corrected places of sun and moon must be divided by the mean *bhūkti*. This, however, is impossible for many of the days. Therefore they divide this distance by the difference between the daily revolutions of sun and moon, which they reckon for the moon as 13 degrees, for the sun as 1 degree.

It is a favourite method in rules of this kind, especially in Indian ones, to reckon by the mean motion of sun and moon. The mean motion of the sun is subtracted from the mean motion of the moon, and the remainder is divided by 732, which is the difference between their two middle *bhūktis*. The quotient then represents days and *ghafts*.

The word *bhūt* is of Indian origin. In the Indian language it is *bhūkti* (= the daily motion of a planet). If the corrected motion is meant, it is called *bhūkti sphaṇa*. If the mean motion is meant, it is called *bhūkti madhyama*, and if the *bhūt* which renders equal is meant, it is called *bhūktyaṃtara*, i.e. the difference between the two *bhūktis*.
The lunar days of the month have special names, which we exhibit in the following diagram. If you know the lunar day in which you are, you find, by the side of the number of the day, its name, and opposite it the karaṣa in which you are. If that which has elapsed of the current day is less than half a day, the karaṣa is a diurnal one; if that which has elapsed of it is more than half a day, it is a nocturnal one. This is the diagram:
<table>
<thead>
<tr>
<th>The number of the day</th>
<th>Their names</th>
<th>The number of the day</th>
<th>Their names</th>
<th>The number of the day</th>
<th>Their names</th>
<th>The number of the day</th>
<th>Their names</th>
<th>Their names</th>
<th>Their names</th>
<th>Their names</th>
<th>Their names</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Amāvāsyā.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Barkhu.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Biya.</td>
<td>10</td>
<td>Navin.</td>
<td>17</td>
<td>Barkhu.</td>
<td>24</td>
<td>Atśin.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Triya.</td>
<td>11</td>
<td>Daḥīn.</td>
<td>18</td>
<td>Biya.</td>
<td>25</td>
<td>Navin.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Caunt.</td>
<td>12</td>
<td>Yaḥīt.</td>
<td>19</td>
<td>Triya.</td>
<td>26</td>
<td>Daḥīn.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Panct.</td>
<td>13</td>
<td>Duvaḥīt.</td>
<td>20</td>
<td>Caunt.</td>
<td>27</td>
<td>Yaḥīt.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Sat.</td>
<td>14</td>
<td>Troḥīt.</td>
<td>21</td>
<td>Panct.</td>
<td>28</td>
<td>Duvaḥīt.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Satn.</td>
<td>15</td>
<td>Caudaḥīt.</td>
<td>22</td>
<td>Sat.</td>
<td>29</td>
<td>Troḥīt.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Atśin.</td>
<td>16</td>
<td>{Pūrṇimā  }</td>
<td>23</td>
<td>Satn.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td>{pancāḥī.}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| The hymens are common to both halves |</p>
<table>
<thead>
<tr>
<th>In daytime</th>
<th>In the night</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catushpada.</td>
<td>Nāga.</td>
</tr>
<tr>
<td>Kinstughna.</td>
<td>Bava.</td>
</tr>
<tr>
<td>Bālava.</td>
<td>Kaulava.</td>
</tr>
<tr>
<td>Taitila.</td>
<td>Gara.</td>
</tr>
<tr>
<td>Baṇīj.</td>
<td>Vihaṭī.</td>
</tr>
<tr>
<td>Bava.</td>
<td>Bālava.</td>
</tr>
<tr>
<td>Kaulava.</td>
<td>Taitila.</td>
</tr>
<tr>
<td>Gara.</td>
<td>Baṇīj.</td>
</tr>
<tr>
<td>Vihaṭī.</td>
<td>Bava.</td>
</tr>
<tr>
<td>Vihaṭī.</td>
<td>Śakuni.</td>
</tr>
</tbody>
</table>
The Hindus attribute to some of the karṣas dominants, as is their custom. Further they give rules showing what during each karṣa must be done or not, rules which are similar to collections of astrological prognostics (as to lucky or unlucky days, &c.). If we give here a second diagram of the karṣas, we thereby simply mean to confirm what we have said already, and to repeat a subject which is unknown among us. Thus it is rendered easy to learn the subject, because learning is the fruit of repetition.

**THE FOUR FIXED KARAṆAS.**

<table>
<thead>
<tr>
<th>In which half of the year they fall</th>
<th>Their name</th>
<th>Their dominants</th>
<th>The prognostics of the karṣas, and for what thing each of them is favourable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the black half.</td>
<td>Śaṅku.</td>
<td>Kali.</td>
<td>Favourable for the action of medicines, of drugs against the bite of serpents, of incantations, of learning, of council-holding, and of reciting holy texts before the idols.</td>
</tr>
<tr>
<td></td>
<td>Cānkhāpāda.</td>
<td></td>
<td>Favourable for placing a king on a throne, giving alms in the name of the Fathers, for making use of four-footed animals in agriculture.</td>
</tr>
<tr>
<td>In the white half.</td>
<td>Nāga.</td>
<td>The zodiacal sign Thāraṇa.</td>
<td>Favourable for weddings, laying a foundation-stone, examining the state of snake-bitten persons, for frightening people and seizing them.</td>
</tr>
<tr>
<td>Kāṇṭāgrāma.</td>
<td>The wind.</td>
<td></td>
<td>Ruins all actions and is favourable only for things connected with marriage, for the construction of parasols, the piercing of the ears, and for works of piety.</td>
</tr>
</tbody>
</table>
### The Seven Movable Karanas

<table>
<thead>
<tr>
<th>In which half of the month they fall</th>
<th>Their name</th>
<th>Their dominants</th>
<th>The pronostics of the karana, and for what thing each of them is favourable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both in the white and black halves.</td>
<td>Bara.</td>
<td>Śukra.</td>
<td>When there is a sāmkṛnti in this karana, it is sitting, and the fruits will, during it, suffer some mishap. It is favourable for travelling, for beginning with things which are intended to last long, for cleansing oneself, for compounding the drugs which make the women fat, and for the sacrifices which the Brahmans offer to the fire.</td>
</tr>
<tr>
<td></td>
<td>Bhāra.</td>
<td>Brahman.</td>
<td>When there is a sāmkṛnti in it, it is sitting, not good for the fruits. It is favourable for the affairs of future life, and for acquiring a heavenly reward.</td>
</tr>
<tr>
<td></td>
<td>Kaulāvā.</td>
<td>Mitra.</td>
<td>When there is a sāmkṛnti in it, it is standing. All that is sown in it will prosper and drop with succulence. It is favourable for making friendships with people.</td>
</tr>
<tr>
<td></td>
<td>Tātila.</td>
<td>Ardhanarīśvara.</td>
<td>When there is a sāmkṛnti in it, it is stretched on the ground. It indicates that the prices will sink, and is favourable for the kneading of aromatic unguents and the compounding of perfumes.</td>
</tr>
<tr>
<td></td>
<td>Gara.</td>
<td>Śiva.</td>
<td>When there is a sāmkṛnti in it, it is stretched on the ground. It indicates that the prices will be depressed, and is favourable for sowing and laying the foundation-stone of a building.</td>
</tr>
<tr>
<td></td>
<td>Parvata.</td>
<td>Śrī.</td>
<td>When there is a sāmkṛnti in it, it is standing. All corn will prosper (tacuma), and is favourable for commerce.</td>
</tr>
<tr>
<td></td>
<td>Varuṇa.</td>
<td></td>
<td>When there is a sāmkṛnti in it, it is stretched on the ground. It indicates that the prices will be insufficient. It is not favourable for anything save the crushing of the sugar-cane. It is considered as unlucky and is not good for travelling.</td>
</tr>
</tbody>
</table>
If you want to find the karaṇas by computation, subtract the corrected place of the sun from that of the moon, reduce the remainder to minutes and divide the number of them by 360. The quotient represents complete karaṇas.

What remains after the division is multiplied by 60, and divided by the bhuktyantara. The quotient represents how much has elapsed of the current karaṇa. Every unit of the number is equal to half a ghaṭā.

We now return to the complete karaṇas. If they are two or less, you are in the second karaṇa. In that case you add one to the number and count the sum off, beginning with catushpada.

If the number of karaṇas is 59, you are in 6akuni.

If it is less than 59 and more than two, add one to them and divide the sum by seven. The remainder, if it is not more than seven, count off, beginning with the beginning of the cycle of the movable karaṇas, i.e. with bava. Thereby you will arrive at the name of the current karaṇa in which you happen to be.

Wishing to remind the reader of something relating to the karaṇas which he perhaps has forgotten, we must tell him that Alkindi and others like him have hit upon the system of the karaṇas, but one which was not sufficiently explained. They did not comprehend the method of those who use the karaṇas. At one time they trace them back to Indian, another time to Babylonian origin, declaring all the time that they are altered on purpose and corrupted by the inadverence of the copyists. They have invented a calculation for them which proceeds in a better order than even the original method itself. But thereby the thing has become something totally different from what it originally was. Their method is this: they count half days, beginning with new moon. The first twelve hours they regard as belonging to the sun, as burning, i.e. unlucky, the next twelve hours as belonging to Venus, the
following twelve hours as belonging to Mercury, and so on according to the order of the planets. Whenever the order returns to the sun, they call his twelve hours the hours of \emph{Albist}, i.e. \emph{vishṭi}.

However, the Hindus do not measure the \emph{karanas} by civil, but by lunar days, nor do they begin with those \emph{burning} hours following upon new moon. According to the calculation of Alkindi, people begin, after new moon, with Jupiter; in that case the periods of the sun are not \emph{burning}. On the other hand, if they begin, according to the method of the Hindus, after new moon with the sun, the hours of \emph{vishṭi} belong to Mercury. Therefore, each method, that of the Hindus and that of Alkindi, must be treated separately.

Because \emph{vishṭi} recurs eight times in a month, and because the points of the compass are eight, we shall exhibit in the eight fields of the following table their \emph{dioerelagovymena} regarding the \emph{karanas}, observations the like of which are made by all astrologers regarding the shapes of the planets and regarding those stars which rise in the single third parts of the zodiacal signs.

<table>
<thead>
<tr>
<th>Their numbers</th>
<th>In what part of the month they fall</th>
<th>Name of the Raja</th>
<th>The direction in which they rise</th>
<th>Description of the Single &quot;Vishṭi.&quot;</th>
<th>Their names according to the book \emph{Brdharrkara}</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>In the night of the 5th \emph{tithi}</td>
<td>...</td>
<td>East</td>
<td>It has three eyes. The hair on its head is like growing sugar-cane. In one hand it has an iron hook, in the other a black serpent. It is strong and violent like running water. It has a long tongue. Its day is only good for war, and those actions in which there is deception and falsification.</td>
<td>Vedavamukha.</td>
</tr>
</tbody>
</table>

Page 208.
<table>
<thead>
<tr>
<th>Their numbers.</th>
<th>In what part of the moon they fall.</th>
<th>Names of the objects.</th>
<th>The directions in which they rise.</th>
<th>Description of the single &quot;Vrishka.&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>In the day of the 9th tihti.</td>
<td>...</td>
<td>Aldana.</td>
<td>It is green, and has a sword in its hand. Its place is in the lightening, thundering, stormy, and cold cloud. Its time is favourable for tearing out fattening herbs, for drinking medicine, for commerce, and for casting gold in a mould.</td>
</tr>
<tr>
<td>III</td>
<td>In the night of the 12th tihti.</td>
<td>Ghora.</td>
<td>North.</td>
<td>It has a black face, thick lips, bushy eyebrows, long hair of the head. It is long, and rides during its day. In the hand it has a sword, it is intent upon devouring men, it emits fire from its mouth, and says ००, ००, ००. Its time is only good for fighting, for killing miscreants, for curing ill people, and for fetching serpents out of their holes.</td>
</tr>
<tr>
<td>IV</td>
<td>In the day of the 16th tihti.</td>
<td>...</td>
<td>Vayava.</td>
<td>It has five faces and ten eyes. Its time is favourable for punishing rebels, for dividing the army into single corps. During it a man must not turn with his face towards the direction where it rises.</td>
</tr>
<tr>
<td>V</td>
<td>In the night of the 16th tihti.</td>
<td>...</td>
<td>West.</td>
<td>It is like a smoky flame. It has three heads, in each three eyes turned upside down. Its hair is standing on end. It sits on the head of a human being, it screams like thunder. It is angry, devours men. It holds in one hand a knife, in the other an axe.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Their names.</th>
<th>Book it belongs to.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghora</td>
<td>Elv (१).</td>
</tr>
<tr>
<td>Vayava</td>
<td>Ghora</td>
</tr>
<tr>
<td>West</td>
<td>Krak (१).</td>
</tr>
<tr>
<td>Vrkhali</td>
<td>Jwala (१).</td>
</tr>
<tr>
<td>Their numbers</td>
<td>In what part of the moon it lay</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>VI</td>
<td>In the day of the 23rd tithi.</td>
</tr>
<tr>
<td>VII</td>
<td>In the night of the 26th tithi.</td>
</tr>
<tr>
<td>VIIIA</td>
<td>In the day of the 40th tithi.</td>
</tr>
</tbody>
</table>
CHAPTER LXXIX.

ON THE YOGAS.

These are times which the Hindus think to be most unlucky and during which they abstain from all action. They are numerous. We shall here mention them.

There are two yogas regarding which all Hindus agree, viz.:

(1.) The moment when sun and moon together stand on two circles, which are, as it were, seizing each other, i.e. each pair of circles, the declinations of which, on one and the same side (of either solstice), are equal. This yoga is called vyatipata.

(2.) The moment when sun and moon stand together on two equal circles, i.e. each pair of circles, the declinations of which, on different sides (of either solstice), are equal. This is called vaidhrita.

It is the signum of the former that in it the sum of the corrected places of sun and moon represents in any case the distance of six zodiacal signs from 0° of Aries, while it is the signum for the latter that the same sum represents the distance of twelve signs. If you compute the corrected places of sun and moon for a certain time and add them together, the sum is either of these signa, i.e. either of these two yogas.

If, however, the sum is less than the amount of the signum or larger, in that case the time of equality (i.e. the time when the sum is equal to either of the signa) is computed by means of the difference between this sum and the term in question, and by means of the
sum of the two bhuki of sun and moon instead of the bhuktyantara, in the same manner as in the canones the time of full moon and opposition is computed.

If you know the distance of the moment from noon or midnight, whether you correct the places of sun and moon according to the one or the other, its time is called the middle one. For if the moon followed the ecliptic as accurately as the sun, this time would be that which we want to find. However, the moon deviates from the ecliptic. Therefore, she does not at that time stand on the circle of the sun or on the circle which, as far as observation goes, is equal to it. For this reason the places of sun and moon and the dragon's head and tail are computed for the middle time.

According to this time they compute the declinations of sun and moon. If they are equal, this is the time which is sought for. If not, you consider the declination of the moon.

If, in computing it, you have added her latitude to the declination of the degree which she occupies, you subtract the latitude of the moon from the declination of the sun. However, if, in computing it, you have subtracted her latitude from the degree which the moon occupies, you add her latitude to the declination of the sun. The result is reduced to arcs by the tables of the kardajat of declination, and these arcs are kept in memory. They are the same which are used in the canon Karanatilaka.

Further, you observe the moon at the middle time. If she stands in some of the odd quarters of the ecliptic, i.e. the vernal and autumnal ones, whilst her declination is less than the declination of the sun, in that case the time of the two declinations equalling each other—and that is what we want to find—falls after the middle, i.e. the future one; but if the declination of the moon is larger than that of the sun, it falls before the middle, i.e. the past one.
If the moon stands in the sees quarters of the ecliptic (i.e. the summer and winter quarters), just the reverse takes place.

Pulisa adds together the declinations of sun and moon in svattpâta, if they stand on different sides of the solstice, and in vaishhrîta, if they stand on the same side of the solstice. Further, he takes the difference between the declinations of sun and moon in svattpâta, if they stand on the same side, and in vaishhrîta, if they stand on different sides. This is the first value which is kept in memory, i.e. the middle time.

Further, he reduces the minutes of the days to masha, supposing that they are less than one-fourth of a day. Then he computes their motions by means of the bhakti of sun and moon and the dragon's head and tail, and he computes their places according to the amount of middle time, which they occupy, in the past and the future. This is the second value which is kept in memory.

By this method he manages to find out the condition of the past and the future, and compares it with the middle time. If the time of the two declinations equalling each other for both sun and moon is past or future, in that case the difference between the two values kept in memory is the portio divisionis (divisor); but if it is past for the one and future for the other, the sum of the two values kept in memory is the portio divisionis.

Further, he multiplies the minutes of the days, which have been found, by the first value kept in memory, and divides the product by the portio divisionis. The quotient represents the minutes of the distance from the middle time which minutes may either be past or future. Thus the time of the two declinations equalling each other becomes known.

The author of the canon Karanatilaka makes us return to the arc of the declination which has been
kept in memory. If the corrected place of the moon is less than three zodiacal signs, it is that which we want; if it is between three and six signs, he subtracts it from six signs, and if it is between six and nine signs, he adds six signs thereto; if it is more than nine signs, he subtracts it from twelve signs. Thereby he gets the second place of the moon, and this he compares with the moon's place at the time of the correction. If the second place of the moon is less than the first, the time of the two declinations equalling each other is future; if it is more than the first, the time of their equalling each other is past.

Further, he multiplies the difference between the two places of the moon by the bhukti of the sun, and divides the product by the bhukti of the moon. The quotient he adds to the place of the sun at the time of the correction, if the second place of the moon is larger than the first; but he subtracts it from the sun's place, if the second place of the moon is less than the first. Thereby he finds the place of the sun for the time when the two declinations are equal to each other.

For the purpose of finding it, he divides the difference between the two places of the moon by the bhukti of the moon. The quotient gives minutes of days, indicative of the distance. By means of them he computes the places of sun and moon, of the dragon's head and tail, and of the two declinations. If the latter are equal, it is that which we want to find. If they are not equal, the author repeats the calculation so long till they are equal and till the correct time has been found.

Thereupon he computes the measure of sun and moon. However, he disregards half of the sum of them, so that in the further calculation he uses only the one half of their measures. He multiplies it by 60 and divides the product by the bhuktyantarā. The quotient represents the minutes of the falling (pdita ?)
The correct time, which has been found, is marked in three different places. From the first number he subtracts the minutes of the falling, and to the last number he adds them. Then the first number is the time of the beginning of vyattiptta or vaikrita, whichever of the two you want to compute. The second number is the time of its middle, and the third number the time of its end.

We have given a detailed account of the bases on which these methods rest in a special book of ours, called Khayal-alkusdflaini (i.e. the image of the two eclipses), and have given an accurate description of them in the canon which we have composed for Sydrvabala (?), the Kashmirian, and to which we have given the title The Arabic Khandakhadyaka.

Bhattila (?) thinks the whole day of either of these two yogas to be unlucky, whilst Varahamihira thinks only that duration of them to be unlucky which is found by the computation. He compares the unlucky portion of the day to the wound of a gazelle shot with a poisoned arrow. The disease does not go beyond the environs of the poisoned shot; if it is cut out, the injury is removed.

According to what Pulisa mentions of Parakara, the Hindus assume a number of vyattipttas in the lunar stations, but all of them are computed by the same method which he has given. For the calculation does not increase in its kind; only the single specimens of it become more numerous.

The Brahman Bhattila (?) says in his canon:—

"Here there are 8 times, which have certain gauge-measure. If the sum of the corrected places of sun and moon is equal to them, they are unlucky. They are:

1. Bak-shilia (?). Its gauge-measure is 4 zodiacal signs.

2. Gandanta. Its gauge-measure is 4 signs and 13½ degrees."
"3. Līta (?), or the general vyatīpāta. Its gauge-measure is 6 signs.

"4. Cīsa (?). Its gauge-measure is 6 signs and 6\(\frac{1}{2}\) degrees.

"5. Barh (?), also called barhvyaatīpāta. Its gauge-measure is 7 signs and 16\(\frac{1}{2}\) degrees.

"6. Kāladanda. Its gauge-measure is 8 signs and 13\(\frac{1}{2}\) degrees.

"7. Vyākshīta (?). Its gauge-measure is 9 signs and 23\(\frac{1}{2}\) degrees.

"8. Vaidhrita. Its gauge-measure is 12 signs."

These yogas are well known, but they cannot all be traced back to a rule in the same way as the 3d and 8th ones. Therefore they have no certain duration determined by minutes of the falling, but only by general estimates. Thus the duration of vyākshīta (?) and of bakshīta (?) is one muhūrta, according to the statement of Varāhamihira, the duration of Gandānta and of Barh (?) two muhūrta.

The Hindus propound this subject at great length and with much detail, but to no purpose. We have given an account of it in the above-mentioned book. (See ii. 208.)

The canon Karanatilaka mentions twenty-seven yogas, which are computed in the following manner:

Add the corrected place of the sun to that of the moon, reduce the whole sum to minutes, and divide the number by 800. The quotient represents complete yogas. Multiply the remainder by 60, and divide the product by the sum of the bhūktis of sun and moon. The quotient represents the minutes of days and minor fractions, viz. that time which has elapsed of the current yoga.

We have copied the names and qualities of the yogas from Śripāla, and exhibit them in the following table:
<table>
<thead>
<tr>
<th>The number</th>
<th>Their names</th>
<th>Whether good or bad</th>
<th>The number</th>
<th>Their names</th>
<th>Whether good or bad</th>
<th>The number</th>
<th>Their names</th>
<th>Whether good or bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vishkambha.</td>
<td>Good</td>
<td>10</td>
<td>Gāñja.</td>
<td>Bad</td>
<td>19</td>
<td>Parigha.</td>
<td>Bad</td>
</tr>
<tr>
<td>2</td>
<td>Pritī.</td>
<td>Good</td>
<td>11</td>
<td>Vṛiddhi.</td>
<td>Good</td>
<td>20</td>
<td>Śiva.</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Rājakama (?)</td>
<td>Bad</td>
<td>12</td>
<td>Dhruva.</td>
<td>Good</td>
<td>21</td>
<td>Siddha.</td>
<td>Good</td>
</tr>
<tr>
<td>4</td>
<td>Saubhāgya.</td>
<td>Good</td>
<td>13</td>
<td>Vyāghāta (?)</td>
<td>Bad</td>
<td>22</td>
<td>Śādhyā.</td>
<td>Middling.</td>
</tr>
<tr>
<td>5</td>
<td>Śobhana.</td>
<td>Good</td>
<td>14</td>
<td>Harśha.</td>
<td>Good</td>
<td>23</td>
<td>Śubha.</td>
<td>Good</td>
</tr>
<tr>
<td>6</td>
<td>Atigāñja.</td>
<td>Bad</td>
<td>15</td>
<td>Vajra.</td>
<td>Bad</td>
<td>24</td>
<td>Śukra.</td>
<td>Good</td>
</tr>
<tr>
<td>7</td>
<td>Sukarman.</td>
<td>Good</td>
<td>16</td>
<td>Siddhi.</td>
<td>Good</td>
<td>25</td>
<td>Brahman.</td>
<td>Good</td>
</tr>
<tr>
<td>8</td>
<td>Dhṛiti.</td>
<td>Good</td>
<td>17</td>
<td>K.-n.-āta (?)</td>
<td>Bad</td>
<td>26</td>
<td>Indra.</td>
<td>Good</td>
</tr>
<tr>
<td>9</td>
<td>Śīla.</td>
<td>Bad</td>
<td>18</td>
<td>Vartya.</td>
<td>Bad</td>
<td>27</td>
<td>Vaidhrīti.</td>
<td>Bad</td>
</tr>
</tbody>
</table>
CHAPTER LXXX.

ON THE INTRODUCTORY PRINCIPLES OF HINDU ASTROLOGY, WITH A SHORT DESCRIPTION OF THEIR METHODS OF ASTROLOGICAL CALCULATIONS.

Our fellow-believers in these (Muslim) countries are not acquainted with the Hindu methods of astrology, and have never had an opportunity of studying an Indian book on the subject. In consequence, they imagine that Hindu astrology is the same as theirs and relate all sorts of things as being of Indian origin, of which we have not found a single trace with the Hindus themselves. As in the preceding part of this our book we have given something of everything, we shall also give as much of their astrological doctrine as will enable the reader to discuss questions of a similar nature with them. If we were to give an exhaustive representation of the subject, this task would detain us very long, even if we limited ourselves to delineate only the leading principles and avoided all details.

First, the reader must know that in most of their prognostics they simply rely on means like auguring from the flight of birds and physiognomy, that they do not—as they ought to do—draw conclusions, regarding the affairs of the sublunar world, from the seconds (sic) of the stars, which are the events of the celestial sphere.

Regarding the number seven as that of the planets, there is no difference between us and them. They call them graha. Some of them are throughout lucky, viz.
Jupiter, Venus and the Moon, which are called \textit{saum-yagraha}. Other three are throughout unlucky, \textit{viz.} Saturn, Mars, and the Sun, which are called \textit{kar	extsubscript{a}yagraha}. Among the latter, they also count the dragon's head, though in reality it is not a star. The nature of one planet is variable and depends upon the nature of that planet with which it is combined, whether it be lucky or unlucky. This is Mercury. However, alone by itself, it is lucky.

The following table represents the natures of the seven planets and everything else concerning them:
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Whether they are</td>
<td>Unlucky.</td>
<td>Lucky, but depending</td>
<td>Unlucky.</td>
<td>Lucky,</td>
<td>Lucky.</td>
<td>Lucky.</td>
<td>Unlucky.</td>
</tr>
<tr>
<td>lucky or unlucky.</td>
<td></td>
<td>upon the nature of the</td>
<td>when it is alone.</td>
<td>when it is alone.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>planet near it.</td>
<td></td>
<td>else</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Middling in the first,</td>
<td></td>
<td>depending</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>lucky in the second,</td>
<td></td>
<td>upon the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>and unlucky in the</td>
<td></td>
<td>nature of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>last ten days of the</td>
<td></td>
<td>the planet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>month.</td>
<td></td>
<td>near it.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What elements they</td>
<td>...</td>
<td>...</td>
<td>Fire.</td>
<td>Earth.</td>
<td>Heaven.</td>
<td>Water.</td>
<td>Wind.</td>
</tr>
<tr>
<td>indicate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>male nor female.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>indicate day or</td>
<td></td>
<td></td>
<td></td>
<td>night</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>night.</td>
<td></td>
<td></td>
<td></td>
<td>together.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>compass they indicate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>indicate.</td>
<td>colour.</td>
<td></td>
<td></td>
<td>green.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What time they</td>
<td>Ayana.</td>
<td>Muhūrta.</td>
<td>Day.</td>
<td>Ritu, i.e. a sixth part of the year.</td>
<td>Month.</td>
<td>Paksha, i.e. half a month.</td>
<td>Year.</td>
</tr>
<tr>
<td>indicate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Names of the planets</td>
<td>Sun</td>
<td>Moon</td>
<td>Mars</td>
<td>Mercury</td>
<td>Jupiter</td>
<td>Venus</td>
<td>Saturn</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----</td>
<td>------</td>
<td>------</td>
<td>---------</td>
<td>---------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>What season they indicate</td>
<td>o</td>
<td>Vara.</td>
<td>Grasha.</td>
<td>śard.</td>
<td>Hemanta</td>
<td>Vasanta</td>
<td>śādṛa.</td>
</tr>
<tr>
<td>What taste they indicate</td>
<td>Bitter</td>
<td>Saltish</td>
<td>...</td>
<td>A mixture of all tastes</td>
<td>Sweet</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>What material they indicate</td>
<td>Bronze</td>
<td>Crystal</td>
<td>Gold</td>
<td>Small pearls</td>
<td>Silver, or if the constellation is very strong, gold</td>
<td>Pearl</td>
<td>Iron</td>
</tr>
<tr>
<td>What dress and clothes they indicate</td>
<td>Thick</td>
<td>New</td>
<td>Burned</td>
<td>Wet from water</td>
<td>Between new and shabby</td>
<td>Whole</td>
<td>Burned</td>
</tr>
<tr>
<td>What angel they indicate</td>
<td>Nema (?)</td>
<td>Ambu, the water</td>
<td>Agni, the fire</td>
<td>Brahman</td>
<td>Mahādeva</td>
<td>Indra</td>
<td>...</td>
</tr>
<tr>
<td>What caste they indicate</td>
<td>Kshatriyas and commanders</td>
<td>Vaiśyas and commanders</td>
<td>Kshatriyas and generals</td>
<td>śūdras and princes</td>
<td>Brahmans and ministers</td>
<td>Brahmans and ministers</td>
<td>...</td>
</tr>
<tr>
<td>Which Veda they indicate</td>
<td>o</td>
<td>o</td>
<td>Sāmaveda</td>
<td>Atharva-veda</td>
<td>Rgveda</td>
<td>Yajurveda</td>
<td>o</td>
</tr>
<tr>
<td>The months of pregnancy</td>
<td>The fourth month, in which the bones become hard</td>
<td>The fifth month, in which the embryo attains consistency</td>
<td>The second month, in which the child becomes complete, and receives the memory</td>
<td>The third month, in which the limbs begin to branch off</td>
<td>The first month, in which the semen and the menstrual blood become mixed</td>
<td>The sixth month, when the hair grows</td>
<td></td>
</tr>
<tr>
<td>Character as based on the three primary forces</td>
<td>Satya</td>
<td>Satya</td>
<td>Tamas</td>
<td>Rajas</td>
<td>Satya</td>
<td>Rajas</td>
<td>Tamas</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>The scale of their magnitude.</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>25 (1)</td>
<td>7</td>
</tr>
<tr>
<td>Years of śaṭāya.</td>
<td>19</td>
<td>25</td>
<td>15</td>
<td>12</td>
<td>15</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Years of naśiś argka.</td>
<td>20</td>
<td>1</td>
<td>2</td>
<td>9</td>
<td>18</td>
<td>20</td>
<td>50</td>
</tr>
</tbody>
</table>
The column of this table which indicates the order of the size and power of the planets, serves for the following purpose:—Sometimes two planets indicate exactly the same thing, exercise the same influence, and stand in the same relation to the event in question. In this case, the preference is given to that planet which, in the column in question, is described as the larger or the more powerful of the two.

The column relating to the months of pregnancy is to be completed by the remark that they consider the eighth month as standing under the influence of a horoscope which causes abortion. According to them, the embryo takes, in this month, the fine substances of the food. If it takes all of them and is then born, it will remain alive; but if it is born before that, it will die from some deficiency in its formation. The ninth month stands under the influence of the moon, the tenth under that of the sun. They do not speak of a longer duration of pregnancy, but if it happens to last longer, they believe that, during this time, some injury is brought about by the wind. At the time of the horoscope of abortion, which they determine by tradition, not by calculation, they observe the conditions and influences of the planets and give their decision accordingly as this or that planet happens to preside over the month in question.

The question as to the friendship and enmity of the planets among each other, as well as the influence of the *dominus domus*, is of great importance in their astrology. Sometimes it may happen that, at a particular moment of time, this *dominium* entirely loses its original character. Further on we shall give a rule as to the computation of the *dominium* and its single years.

There is no difference between us and the Hindus regarding the number twelve as the number of the signs of the ecliptic, nor regarding the manner in which the *dominium* of the planets is distributed over them.

The following table shows what qualities are peculiar to each zodiacal sign as a whole:—
<table>
<thead>
<tr>
<th>Zodiac Signs</th>
<th>Aries</th>
<th>Taurus</th>
<th>Gemini</th>
<th>Cancer</th>
<th>Leo</th>
<th>Virgo</th>
<th>Libra</th>
<th>Scorpio</th>
<th>Arc-tenens</th>
<th>Capricornus</th>
<th>Am- phora</th>
<th>Pisces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitudes (Altitude)</td>
<td>10</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>The directions.</td>
<td>Due east.</td>
<td>S.S.E.</td>
<td>W.S.W.</td>
<td>N.N.W.</td>
<td>E.N.E.</td>
<td>Due south.</td>
<td>Due west.</td>
<td>Due north.</td>
<td>E.S.E.</td>
<td>S.S.W.</td>
<td>W.N.W.</td>
<td>N.N.E.</td>
</tr>
<tr>
<td>The Zodiacal Signs</td>
<td>Aries</td>
<td>Taurus</td>
<td>Gemini</td>
<td>Cancer</td>
<td>Leo</td>
<td>Virgo</td>
<td>Libra</td>
<td>Scorpio</td>
<td>Sagittarius</td>
<td>Capricornus</td>
<td>Aquarius</td>
<td>Pisces</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>-----</td>
<td>-------</td>
<td>-------</td>
<td>---------</td>
<td>-------------</td>
<td>-------------</td>
<td>-----------</td>
<td>--------</td>
</tr>
<tr>
<td>Whether turning, fixed or double-bodied.</td>
<td>Moving</td>
<td>Resting</td>
<td>Moving and resting together</td>
<td>Moving</td>
<td>Resting</td>
<td>Moving and resting together</td>
<td>Moving</td>
<td>Resting</td>
<td>Moving and resting together</td>
<td>Moving</td>
<td>Resting</td>
<td>Moving and resting together</td>
</tr>
<tr>
<td>Whether at night, or during day, according to some people.</td>
<td>At night</td>
<td>At night</td>
<td>At night</td>
<td>During day</td>
<td>During day</td>
<td>During day</td>
<td>At night</td>
<td>The loins</td>
<td>The loins</td>
<td>The loins</td>
<td>The loins</td>
<td>During day</td>
</tr>
<tr>
<td>What parts of the body they indicate.</td>
<td>Head</td>
<td>Face</td>
<td>Shoulder and hands</td>
<td>Breast</td>
<td>Belly</td>
<td>Hip</td>
<td>Under the navel</td>
<td>Male and female genitals</td>
<td>The knees</td>
<td>The knees</td>
<td>The knees</td>
<td>During day</td>
</tr>
<tr>
<td>Seasons.</td>
<td>Vasanta</td>
<td>Grishma</td>
<td>Grishma</td>
<td>Varaha</td>
<td>Varaha</td>
<td>Garad</td>
<td>Garad</td>
<td>Hemanta</td>
<td>Hemanta</td>
<td>Hemanta</td>
<td>Kedara</td>
<td>Vasanta</td>
</tr>
<tr>
<td>Their figures.</td>
<td>A ram</td>
<td>An ox</td>
<td>A man with a lyre, and a club in his hand</td>
<td>Crab</td>
<td>Lion</td>
<td>A girl with an ear of corn in her hand</td>
<td>A scale</td>
<td>A scorpion</td>
<td>A horse, the head and upper half of which have human shape</td>
<td>A being with the face of a goat. There is much water in its figure</td>
<td>A kind of boat or barge</td>
<td>Two fishes</td>
</tr>
<tr>
<td>What kinds of beings they are.</td>
<td>Quadruped.</td>
<td>Quadruped.</td>
<td>Human biped.</td>
<td>Amphibious.</td>
<td>Quadruped.</td>
<td>Biped.</td>
<td>Biped.</td>
<td>Amphibious.</td>
<td>The upper half a biped, the lower half a quadruped.</td>
<td>The first half a biped, the latter half watery.</td>
<td>The first half a biped, the other half watery, or the whole a human being.</td>
<td>Watery.</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------</td>
<td>------------</td>
<td>-------------</td>
<td>-------------</td>
<td>------------</td>
<td>-------</td>
<td>-------</td>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>The times of their strongest influence according to the different kinds.</td>
<td>At night.</td>
<td>At night.</td>
<td>During the day.</td>
<td>During the sahddhi.</td>
<td>At night.</td>
<td>During the day.</td>
<td>During the sahddhi.</td>
<td>During the sahddhi.</td>
<td>The human part during the day, the other at night.</td>
<td>The human part in daytime, the other at night.</td>
<td>During the sahddhi.</td>
<td></td>
</tr>
</tbody>
</table>
The height or altitudo of a planet is called, in the Indian language, accastha, its particular degree paramocasta. The depth or defectio of a planet is called ncastha, its particular degree paramantcastha. Mālatrīkona is a powerful influence, attributed to a planet, when it is in the gaudium in one of its two houses (cf. ii. 225).

They do not refer the aspectus trigoni to the elements and the elementary natures, as it is our custom to do, but refer them to the points of the compass in general, as has been specified in the table.

They call the turning zodiacal sign (τροπωτόν) caratēs, i.e. moving, the fixed one (στεφέων) sthīrastēs, i.e. the resting one, and the double-bodied one (διωνυμά) dīvōnīmā, i.e. both together.

As we have given a table of the zodiacal signs, we next give a table of the houses (domus), showing the qualities of each of them. The one half of them above the earth they call chātra, i.e. parasol, and the half under the earth they call nau, i.e. ship. Further, they call the half ascending to the midst of heaven and the other half descending to the cardo of the earth, dhānu, i.e. the bow. The cardines they call kandra (κάντρον), the next following houses pāṇaphara (παναφορά), and the inclining houses āpoklima (ἐπόκλιμα):—
<table>
<thead>
<tr>
<th>The House</th>
<th>What they indicate</th>
<th>On the aspects, the ascendants being taken as basis</th>
<th>Which celestial sign exercises the greatest influence in them</th>
<th>Which celestial sign exercises the greatest influence in them</th>
<th>How much is to be subtracted from the unsteady years of the House</th>
<th>How much is to be subtracted from the unsteady years of the House</th>
<th>How they are divided according to the horizon</th>
<th>Into what classes they are divided, according to the shadow of moon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascendant</td>
<td>Head and soul.</td>
<td>Basis for the calculation</td>
<td>The human signs</td>
<td>Mercury and Jupiter</td>
<td>0</td>
<td>0</td>
<td>Ascending bow</td>
<td>Ship.</td>
</tr>
<tr>
<td>II</td>
<td>Face and property.</td>
<td>Two stand in aspect with the ascendant</td>
<td></td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>Ascending bow</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>The two arms and brothers.</td>
<td>The ascendant looks towards it, but it does not look towards the ascendant</td>
<td></td>
<td>o</td>
<td>o</td>
<td>o</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Heart, parents, friends, house, and joy.</td>
<td>Two stand in aspect with the ascendant</td>
<td>The watery signs</td>
<td>Venus and Moon</td>
<td>o</td>
<td>o</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Belly, child, and cleverness.</td>
<td>Two stand in aspect with the ascendant</td>
<td></td>
<td>o</td>
<td>o</td>
<td>o</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>The two sides, the enemy and riding animals.</td>
<td>It looks towards the ascendant, but the ascendant does not look towards it</td>
<td></td>
<td>o</td>
<td>o</td>
<td>o</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VII</td>
<td>Under the naval and women.</td>
<td>Two stand in aspect with the ascendant</td>
<td></td>
<td>...</td>
<td>Saturn, 1/3 of them</td>
<td>1/3 of them</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIII</td>
<td>Return and death.</td>
<td>The ascendant looks towards it, but it does not look towards the ascendant</td>
<td></td>
<td>...</td>
<td>o</td>
<td>1/3</td>
<td>Farewell</td>
<td></td>
</tr>
<tr>
<td>IX</td>
<td>The two loins, journey and debt.</td>
<td>Two stand in aspect with the ascendant</td>
<td></td>
<td>...</td>
<td>o</td>
<td>1/3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The houses</td>
<td>What they indicate</td>
<td>On the aspects, the ascendants being taken as basis</td>
<td>Which planets have the greatest influence on them</td>
<td>Which planets exercise the greatest influence on them</td>
<td>How much it is to be subtracted from the unlucky years of the House</td>
<td>How much is to be subtracted from the lucky years of the House</td>
<td>How they are divided according to the houses</td>
<td>Ascending bow</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------</td>
<td>-------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>I</td>
<td>The two knees and action.</td>
<td>Two stand in aspect with the ascendants.</td>
<td>The quadrupeds.</td>
<td>Mars.</td>
<td>I</td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XI</td>
<td>The two calves and income.</td>
<td>It looks towards the ascendants, but the ascendants do not look towards it.</td>
<td>o</td>
<td>o</td>
<td>i</td>
<td>i</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XII</td>
<td>The two feet and expenses.</td>
<td>Two do not stand in aspect with the ascendants.</td>
<td>o</td>
<td>o</td>
<td>The whole</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The hitherto mentioned details are in reality the cardinal-points of Hindu astrology, viz. the planets, zodiacal signs, and houses. He who knows how to find out what each of them means or portends deserves the title of a clever adept and of a master in this art.

Next follows the division of the zodiacal signs in minor portions, first that in nimbahras, which are called horā, i.e. hour, because half a sign rises in about an hour's time. The first half of each male sign is unlucky as standing under the influence of the sun, because he produces male beings, whilst the second half is lucky as standing under the influence of the moon, because she produces female beings. On the contrary, in the female signs the first half is lucky, and the second unlucky.

Further, there are the triangles, called draśākṣa. There is no use in enlarging on them, as they are simply identical with the so-called draśājñāt of our system.

Further, the nimbahrd (Persian, "the nine parts"),
called navāṁśaka. As our books of introduction to the art of astrology mention two kinds of them, we shall here explain the Hindu theory regarding them, for the information of Indophiles. You reduce the distance between 0° of the sign and that minute, the nūhbahr of which you want to find, to minutes, and divide the number by 200. The quotient represents complete nūbahras or ninth-parts, beginning with the turning sign, which is in the triangle of the sign in question; you count the number off on the consecutive signs, so that one sign corresponds to one nūhbahr. That sign which corresponds to the last of the ninth-parts which you have is the dominant of the nūhbahr we want to find.

The first nūhbahr of each turning sign, the fifth of each fixed sign, and the ninth of each double-bodied sign is called vargottama, i.e. the greatest portion.

Further, the twelfth-parts, called the twelve rulers. For a certain place within a sign they are found in the following manner:—Reduce the distance between 0° of the sign and the place in question to minutes, and divide the number by 150. The quotient represents complete twelfth-parts, which you count off on the following signs, beginning with the sign in question, so that one twelfth-part corresponds to one sign. The dominant of the sign, to which the last twelfth-part corresponds, is at the same time the dominant of the twelfth-part of the place in question.

Further, the degrees called triṇāṁśaka, i.e. the thirty degrees, which correspond to our limits (or ṛṣa). Their order is this: The first five degrees of each male sign belong to Mars, the next following five to Saturn, the next eight to Jupiter, the next seven to Mercury, and the last five to Venus. Just the reverse order takes place in the female signs, viz. the first five degrees belong to Venus, the next seven to Mercury, the next eight to Jupiter, the next five to Saturn, and the last five to Mercury.
These are the elements on which every astrological calculation is based.

The nature of the aspect of every sign depends upon the nature of the ascendant which at a given moment rises above the horizon. Regarding the aspects they have the following rule:—

A sign does not look at, i.e., does not stand in aspect with the two signs immediately before and after it. On the contrary, each pair of signs, the beginnings of which are distant from each other by one-fourth or one-third or one-half of the circle, stand in aspect with each other. If the distance between two signs is one-sixth of the circle, the signs forming this aspect are counted in their original order; but if the distance is five-twelfths of the circle, the signs forming the aspect are counted in the inverse order.

There are various degrees of aspects, viz.:—

The aspect between one sign and the fourth or eleventh following one is a fourth-part of an aspect;

The aspect between one sign and the fifth or ninth following one is half an aspect;

The aspect between a sign and the sixth or tenth following one is three-quarters of an aspect;

The aspect between a sign and the seventh following one is a whole aspect.

The Hindus do not speak of an aspect between two planets which stand in one and the same sign.

With reference to the change between the friendship and enmity of single planets with regard to each other, the Hindus have the following rule:—

If a planet comes to stand in signs which, in relation to its rising, are the tenth, eleventh, twelfth, first, second, third, and fourth signs, its nature undergoes a change for the better. If it is most inimical, it becomes moderated; if it is moderated, it becomes friendly; if it is friendly, it becomes most friendly. If the planet comes to stand in all the other signs, its nature undergoes a
CHAPTER LXXX.

change for the worse. If originally it is friendly, it becomes moderate; if it is moderate, it becomes inimical; if it is inimical, it becomes even worse. Under such circumstances, the nature of a planet is an accidental one for the time being, associating itself with its original nature.

After having explained these things, we now proceed to mention the four forces which are peculiar to each planet:

I. The habitual force, called ṣṭhānabala, which the planet exercises, when it stands in its altitudo, its house, or the house of its friend, or in the ruebahr of its house, or its altitudo, or its mālatrikona, i.e. its gaudium in the line of the lucky planets. This force is peculiar to sun and moon when they are in the lucky signs, as it is peculiar to the other planets when they are in the unlucky signs. Especially this force is peculiar to the moon in the first third of her lunation, when it helps every planet which stands in aspect with her to acquire the same force. Lastly, it is peculiar to the ascendens if it is a sign representing a biped.

II. The force called drishṭibala, i.e. the lateral one, Lagh. ii. 11. also called drigbala, which the planet exercises when standing in the cardo in which it is strong, and, according to some people, also when standing in the two houses immediately before and after the cardo. It is peculiar to the ascendens in the day, if it is a sign representing a biped, and in the night, if it is a four-footed sign, and in both the saṁdhis (periods of twilight at the beginning and end) of the other signs. This in particular refers to the astrology of nativities. In the other parts of astrology this force is peculiar, as they maintain, to the tenth sign if it represents a quadruped, to the seventh sign if it is Scorpio and Cancer, and to the fourth sign if it is Amphora and Cancer.

III. The conquering force, called ceshtābala, which Lagh. ii. 5. a planet exercises, when it is in retrograde motion,
when it emerges from concealment, marching as a visible star till the end of four signs, and when in the north it meets one of the planets except Venus. For to Venus the south is the same as the north is to the other planets. If the two (______? illegible) stand in it (the south), it is peculiar to them that they stand in the ascending half (of the sun’s annual rotation), proceeding towards the summer solstice, and that the moon in particular stands near the other planets—except the sun—which afford her something of this force.

The force is, further, peculiar to the ascendens, if its dominant is in it, if the two stand in aspect with Jupiter and Mercury, if the ascendens is free from an aspect of the unlucky planets, and none of them—except the dominant—is in the ascendens. For if an unlucky planet is in it, this weakens the aspect of Jupiter and Mercury, so that their dwelling in this force loses its effect.

IV. The fourth force is called kalubala, i.e. the temporal one, which the daily planets exercise in the day, the nightly planets during the night. It is peculiar to Mercury in the saṅdhi of its rotation, whilst others maintain that Mercury always has this force, because he stands in the same relation to both day and night.

Further, this force is peculiar to the lucky planets in the white half of the month, and to the unlucky stars in the black half. It is always peculiar to the ascendens.

Other astrologers also mention years, months, days, and hours among the conditions, under which the one or other of the four forces is peculiar to a planet.

These, now, are the forces which are calculated for the planets and for the ascendens.

If several planets own, each of them, several forces, that one is preponderant which has the most of them. If two planets have the same number of balas or forces, that one has the preponderance the magnitude of which is the larger. This kind of magnitude is in the table of
ii. 215, called na\textit{aisargikabala}. This is the order of the \textit{Lagh.} ii. 7 planets in magnitude or force.

The middle years which are computed for the planets are of three different species, two of which are computed according to the distance from the \textit{altitudo}. The measures of the first and second species we exhibit in the table (ii. 215).

The \textit{sha\text{\textasciitilde}d\text{\textasciitilde}ya} and \textit{na\textit{i}aisargika} are reckoned as the degree of \textit{altitudo}. The first species is computed when the above-mentioned forces of the sun are preponderating over the forces of the moon and the \textit{ascendens} separately.

The second species is computed if the forces of the moon are preponderating over those of the sun and those of the \textit{ascendens}.

The third species is called \textit{an\text{\textasciitilde}s\text{\textasciitilde}d\text{\textasciitilde}ya}, and is computed if the forces of the \textit{ascendens} are preponderating over those of sun and moon.

The computation of the years of the first species for each planet, if it does not stand in the degree of its \textit{altitudo}, is the following:—

You take the distance of the star from the degree of \textit{Lagh.} vi. 1. its \textit{altitudo} if this distance is more than six signs, or the difference between this distance and twelve signs, in case it is less than six signs. This number is multiplied by the number of the years, indicated by the table on page 312. Thus the signs sum up to months, the degrees to days, the minutes to day-minutes, and these values are reduced, each sixty minutes to one day, each thirty days to one month, and each twelve months to one year.

The computation of these years for the \textit{ascendens} is this:—

Take the distance of the degree of the star from 0° of \textit{Lagh.} vi. 2. Aries, one year for each sign, one month for each 2\textfrac{1}{2} degrees, one day for each five minutes, one day-minute for each five seconds.
The computation of the years of the second species for the planets is the following:—

Take the distance of the star from the degree of its altitude according to the just-mentioned rule (ii. 227). This number is multiplied by the corresponding number of years which is indicated by the table, and the remainder of the computation proceeds in the same way as in the case of the first species.

The computation of this species of years for the ascendants is this:—

Take the distance of its degree from 0° of Aries, a year for each nubahr; months and days, &c., in the same way as in the preceding computation. The number you get is divided by 12, and the remainder being less than 12, represents the number of years of the ascendum.

The computation of the years of the third species is the same for the planets as for the ascendants, and is similar to the computation of the years of the ascendants of the second species. It is this:—

Take the distance of the star from 0° of Aries, one year for each nubahr, multiplying the whole distance by 108. Then the signs sum up to months, the degrees to days, the minutes to day-minutes, the smaller measure being reduced to the larger one. The years are divided by 12, and the remainder which you get by this division is the number of years which you want to find.

All the years of this kind are called by the common name ayurda. Before they undergo the equation they are called maithyamda, and after they have passed it they are called sphutda, i.e. the corrected ones.

The years of the ascendants in all three species are corrected ones, which do not require an equation by means of two kinds of subtraction, one according to the position of the ascendant in the ether, and a
second according to its position in relation to the horizon.

To the third kind of years is peculiar an equation by means of an addition, which always proceeds in the same manner. It is this:—

If a planet stands in its largest portion or in its house, the drekkāṇa of its house or the drekkāṇa of its altitudo, in the nuhbahr of its house or the nuhbahr of its altitudo, or, at the same time, in most of these positions together, its years will be the double of the middle number of years. But if the planet is in retrograde motion or in its altitudo, or in both together, its years are the threefold of the middle number of years.

Regarding the equation by means of the subtraction (vide ii, 228) according to the first method, we observe that the years of the planet, which is in its dejectio, are reduced to two-thirds of them if they are of the first or second species, and to one-half if they belong to the third species. The standing of a planet in the house of its opponent does not impair the number of its years.

The years of a planet which is concealed by the rays of the sun, and thus prevented from exercising an influence, are reduced to one-half in the case of all three species of years. Only Venus and Saturn are excepted, for the fact of their being concealed by the rays of the sun does not in any way decrease the numbers of their years.

As regards the equation by means of subtraction according to the second method, we have already stated in the table (ii, 221, 222) how much is subtracted from the unlucky and lucky stars, when they stand in the houses above the earth. If two or more planets come together in one house, you examine which of them is the larger and stronger one. The subtraction is added to the years of the stronger planet and the remainder is left as it is.

If to the years of a single planet, years of the third
species, two additions from different sides are to be made, only one addition, viz., the longer one, is taken into account. The same is the case when two subtractions are to be made. However, if an addition as well as a subtraction is to be made, you do the one first and then the other, because in this case the sequence is different.

By these methods the years become adjusted, and the sum of them is the duration of the life of that man who is born at the moment in question.

It now remains for us to explain the method of the Hindus regarding the periods (sic). Life is divided in the above-mentioned three species of years, and immediately after the birth, into years of sun and moon. That one is preponderating which has the most forces and balas (vide ii. 225); if they equal each other, that one is preponderating which has the greatest portio (sic) in its place, then the next one, &c. The companion of these years is either the ascendent or that planet which stands in the cardines with many forces and portiones. The several planets come together in the cardines, their influence and sequence are determined by their forces and shares. After them follow those planets which stand near the cardines, then those which stand in the inclined signs, their order being determined in the same way as in the preceding case. Thus becomes known in what part of the whole human life the years of every single planet fall.

However, the single parts of life are not computed exclusively in the years of the one planet, but according to the influences which companion-stars exercise upon it, i.e. the planets which stand in aspect with it. For they make it partake in their rule and make it share in their division of the years. A planet which stands in the same sign with the planet ruling over the part of life in question, shares with it one-half. That which stands in the fifth and ninth signs, shares with
it one-third. That which stands in the fourth and eighth signs, shares with it one-fourth. That which stands in the seventh sign, shares with it one-seventh. If, therefore, several planets come together in one position, all of them have in common that share which is necessitated by the position in question.

The method for the computation of the years of such a companionship (if the ruling planet stands in aspect with other planets) is the following:—

Take for the master of the years (i.e. that planet which rules over a certain part of the life of a man) one as numerator and one as denominator, i.e. \( \frac{1}{3} \), one whole, because it rules over the whole. Further, take for each companion (i.e. each planet which stands in aspect with the former) only the numerator of its denominator (not the entire fraction). You multiply each denominator by all the numerators and their sum, in which operation the original planet and its fraction are disregarded. Thereby all the fractions are reduced to one and the same denominator. The equal denominator is disregarded. Each numerator is multiplied by the sum of the year and the product divided by the sum of the numerators. The quotient represents the years kālambāka (kālābhāga 1) of a planet.

As regards the order of the planets, after the question as to the preponderance of their influence has been decided (i.e. text in disorder), in so far as each of them exercises its individual influence. In the same way as has already been explained (vide ii. 230), the preponderating planets are those standing in the cardines, first the strongest, then the less strong, &c., then those standing near the cardines, and Lastly those standing in the inclined signs.

From the description given in the preceding pages, the reader learns how the Hindus compute the duration of human life. He learns from the positions of the planets, which they occupy on the origin (i.e. at
the moment of birth) and at every given moment of life in what way the years of the different planets are distributed over it. To these things Hindu astrologers join certain methods of the astrology of nativities, which other nations do not take into account. They try, e.g., to find out if, at the birth of a human being, its father was present, and conclude that he was absent, if the moon does not stand in aspect with the ascendens, or if the sign in which the moon stands is enclosed between the signs of Venus and Mercury, or if Saturn is in the ascendens, or if Mars stands in the seventh sign.

Chap. iii. 4 (†).—Further, they try to find out if the child will attain full age by examining sun and moon. If sun and moon stand in the same sign, and with them an unlucky planet, or if the moon and Jupiter just quit the aspect with the ascendens, or if Jupiter just quits the aspect with the united sun and moon, the child will not live to full age.

Further, they examine the station in which the sun stands, in a certain connection with the circumstances of a lamp. If the sign is a turning one, the light of the lamp, when it is transferred from one place to the other, moves. If the sign is a fixed one, the light of the lamp is motionless; and if the sign is a double-bodied one, it moves one time and is motionless another.

Further, they examine in what relation the degrees of the ascendens stand to 30. Corresponding to it is the amount of the wick of the lamp which is consumed by burning. If the moon is full moon, the lamp is full of oil; at other times the decrease or increase of the oil corresponds to the wane and increase of the moonlight.

Chap. iv. 5.—From the strongest planet in the cardines they draw a conclusion relating to the door of the house, for its direction is identical with the direction of this planet or with the direction of the sign of the ascendens, in case there is no planet in the cardines.

Chap. iv. 6.—Further, they consider which is the
light-giving body, the sun or moon. If it is the sun, the house will be destroyed. The moon is beneficent, Mars burning, Mercury bow-shaped, Jupiter constant, and Saturn old.

Chap. iv. 7.—If Jupiter stands in its altitudo in the tenth sign, the house will consist of two wings or three. If its indicium is strong in Arcitenens, the house will have three wings; if it is in the other double-bodied signs, the house will have two wings.

Chap. iv. 8.—In order to find prognostics for the throne and its feet they examine the third sign, its squares and its length from the twelfth till the third signs. If there are unlucky planets in it, either the foot or the side will perish in the way that the unlucky planet prognosticates. If it is Mars, it will be turned; if it is the sun, it will be broken; and if it is Saturn, it will be destroyed by old age.

Chap. iv. 10.—The number of women who will be present in a house corresponds to the number of stars which are in the signs of the ascendens and of the moon. Their qualities correspond to the images of these constellations.

Those stars of these constellations which stand above the earth refer to those women who go away from the house, and those which stand under the earth prognosticate the women who will come to the house and enter it.

Further, they inquire into the coming of the spirit life in man from the dominant of the drekkāna of the stronger planet of either sun or moon. If Jupiter is the drekkāna, it comes from Devaloka; if it is Venus or the moon, the spirit comes from Pitriloka; if it is Mars or the sun, the spirit comes from Vṛścikaloka; and if it is Saturn or Mercury, the spirit comes from Bhṛguloka.

Likewise they inquire into the departing of the soul after the death of the body, when it departs to that planet which is stronger than the dominant of the
drekkaṇa of the sixth or eighth houses, according to a similar rule to that which has just been laid down. However, if Jupiter stands in its altitude, in the sixth house, or in the eighth, or in one of the cardines, or if the ascendens is Pisces, and Jupiter is the strongest of the planets, and if the constellation of the moment of death is the same as that of the moment of birth, in that case the spirit (or soul) is liberated and no longer wanders about.

I mention these things in order to show the reader the difference between the astrological methods of our people and those of the Hindus. Their theories and methods regarding aerial and cosmic phenomena are very lengthy and very subtle at the same time. As we have limited ourselves to mentioning, in their astrology of nativities, only the theory of the determination of the length of life, we shall in this department of science limit ourselves to the species of the comets, according to the statements of those among them who are supposed to know the subject thoroughly. The analogy of the comets shall afterwards be extended to other more remote subjects.

The head of the Dragon is called rāhu, the tail ketu. The Hindus seldom speak of the tail, they only use the head. In general, all comets which appear on heaven are also called ketu.

Varāhamihira says (chap. iii. 7–12):—

"The Head has thirty-three sons who are called tāmasakākāra. They are the different kinds of the comets, there being no difference whether the head extends away from them or not. Their prognostics correspond to their shapes, colours, sizes, and positions. V. 8.—The worst are those which have the shape of a crow or the shape of a beheaded man, those which have the shape of a sword, dagger, bow and arrow. V. 9, 10.—They are always in the neighbourhood of sun and moon, exciting the waters so that they become
thick, and exciting the air that it becomes glowing red. They bring the air into such an uproar that the tornadoes tear out the largest trees, that flying pebbles beat against the calves and knees of the people. They change the nature of the time, so that the seasons seem to have changed their places. When unlucky and calamitous events become numerous, such as earthquakes, landslips, burning heat, red glow of heaven, uninterrupted howling of the wild beasts and screaming of the birds, then know that all this comes from the children of the Head. V. 11.—And if these occurrences take place together with an eclipse or the effulgence of a comet, then recognise in this what thou hast predicted, and do not try to gain prognostics from other beings but the Sons of the Head. V. 12.—In the place of the calamity, point towards their (the comets') region, to all eight sides with relation to the body of the sun."

Varāhamihira says in the Samhitā (chap. xi. 1-7):—

"I have spoken of the comets not before having exhausted what is in the books of Garga, Parāśara, Asita and Devala, and in the other books, however numerous they may be.

"It is impossible to comprehend their computation, if the reader does not previously acquire the knowledge of their appearing and disappearing, because they are not of one kind, but of many kinds.

"Some are high and distant from the earth, appearing between the stars of the lunar stations. They are called divya.

"Others have a middle distance from the earth, appearing between heaven and earth. They are called antarikshya.

"Others are near to the earth, falling down upon the earth, on the mountains, houses and trees.

"Sometimes you see a light falling down to the earth, which people think to be a fire. If it is not fire, it is keturalpa, i.e. having the shape of a comet.

"Those animals which, when flying in the air, look
like sparks or like fires which remain in the houses of the pishcas, the devils, and of the demons, efflorescent substances and others do not belong to the genus of the comets.

"Therefore, are you can tell the prognostics of the comets, you must know their nature, for the prognostics are in agreement with it. That category of lights which is in the air, falling on the banners, weapons, houses, trees, on horses and elephants, and that category coming from a Lord which is observed among the stars of the lunar stations—if a phenomenon does not belong to either of these two categories nor to the above-mentioned phantoms, it is a telluric ketu.

V. 5.—"Scholars differ among each other regarding the number of the comets. According to some there are 101, according to others 1000. According to Narada, the sage, they are only one, which appears in a multitude of different forms, always divesting itself of one form and arraying itself in another.

V. 7.—"Their influence lasts for as many months as their appearance lasts days. If the appearance of a comet lasts longer than one and a half month, subtract from it forty-five days. The remainder represents the months of its influence. If the appearance lasts longer than two months, in that case state the years of its influence to be equal to the number of the months of its appearance. The number of comets does not exceed the number 1000."

We give the contents of the following table in order to facilitate the study of the subject, although we have not been able to fill out all the single fields of the diagram, because the manuscript tradition of the single paragraphs of the book either in the original or in the copy which we have at our disposal is corrupt. The author intends by his explanations to confirm the theory of the ancient scholars regarding the two numbers of comets which he mentions on their authority, and he endeavours to complete the number 1000.
<table>
<thead>
<tr>
<th>Their names</th>
<th>Their descent</th>
<th>How many stars each comet has.</th>
<th>Sum total</th>
<th>Their qualities.</th>
<th>From what direction they appear.</th>
<th>Their prognostics.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The children of Kirāṇa.</td>
<td>25</td>
<td>25</td>
<td>Similar to pearls in rivulets of crystal or gold-coloured.</td>
<td>Only in east and west.</td>
<td>It bodes the fighting of the kings with each other.</td>
<td></td>
</tr>
<tr>
<td>The children of the Fire (?)</td>
<td>25</td>
<td>50</td>
<td>Green, or of the colour of fire or of lac, or of blood, or of the blossom of the tree.</td>
<td>S.E.</td>
<td>It bodes pestilence.</td>
<td></td>
</tr>
<tr>
<td>The children of Death.</td>
<td>25</td>
<td>75</td>
<td>With crooked tails, their colour inclining to black and dark.</td>
<td>S.</td>
<td>It bodes hunger and pestilence.</td>
<td></td>
</tr>
<tr>
<td>The children of the Earth.</td>
<td>22</td>
<td>97</td>
<td>Round, radiant, of the colour of water or sesame oil, without tails.</td>
<td>N.E.</td>
<td>It bodes fertility and wealth.</td>
<td></td>
</tr>
<tr>
<td>The children of the Moon.</td>
<td>3</td>
<td>100</td>
<td>Like roses, or white lotus, or silver, or polished iron or gold. It shines like the moon.</td>
<td>N.</td>
<td>It bodes evil, in consequence of which the world will be turned topsy-turvy.</td>
<td></td>
</tr>
<tr>
<td>Brahmanda.</td>
<td>Son of Brahma.</td>
<td>1</td>
<td>101</td>
<td>Having three colours and three tails.</td>
<td>In all directions.</td>
<td>It bodes wickedness and destruction.</td>
</tr>
<tr>
<td>The children of Venus.</td>
<td>84</td>
<td>185</td>
<td>White, large, brilliant.</td>
<td>N. and N.E.</td>
<td>It bodes evil and fear.</td>
<td></td>
</tr>
<tr>
<td>Kanaka.</td>
<td>The children of Saturn.</td>
<td>...</td>
<td>Radiant, as if they were horns.</td>
<td>In all directions.</td>
<td>It bodes misfortune and death.</td>
<td></td>
</tr>
<tr>
<td>Vikaca.</td>
<td>The children of Jupiter.</td>
<td>65</td>
<td>Brilliant, white, without any tails.</td>
<td>S.</td>
<td>It bodes destruction and misfortune.</td>
<td></td>
</tr>
<tr>
<td>Their names.</td>
<td>Their descent.</td>
<td>How many stars each comet has.</td>
<td>Sum total.</td>
<td>Their qualities.</td>
<td>From what direction they appear.</td>
<td>Their prognostics.</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------</td>
<td>--------------------------------</td>
<td>------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Taskara, i.e. the thief.</td>
<td>The children of Mercury.</td>
<td>51</td>
<td>...</td>
<td>White, thin, long. The eye is dazzled by them.</td>
<td>In all directions.</td>
<td>It bodes misfortune.</td>
</tr>
<tr>
<td>Kauśikuma.</td>
<td>The children of Mars.</td>
<td>60</td>
<td>...</td>
<td>It has three tails, and the colour of the flame.</td>
<td>N.</td>
<td>It bodes the extremity of evil.</td>
</tr>
<tr>
<td>Tāmasaka-ktiśaka.</td>
<td>The children of the Head.</td>
<td>36</td>
<td>...</td>
<td>Of different shapes.</td>
<td>About the sun and moon.</td>
<td>It bodes fire.</td>
</tr>
<tr>
<td>Viśvarāpa.</td>
<td>The children of the Fire.</td>
<td>120</td>
<td>...</td>
<td>Of a blazing light like the flame.</td>
<td></td>
<td>It bodes evil.</td>
</tr>
<tr>
<td>Aruṇa.</td>
<td>The children of the Wind.</td>
<td>77</td>
<td>...</td>
<td>They have no body, that you could see a star in them. Only their rays are united, so that these appear as rivulets. Their colour is reddish or greenish.</td>
<td>...</td>
<td>It bodes general destruction.</td>
</tr>
<tr>
<td>Gaṇaka.</td>
<td>The children of Prajāpati.</td>
<td>304</td>
<td>...</td>
<td>Square comets, eight in appearance, and 304 in number.</td>
<td></td>
<td>It bodes much evil and destruction.</td>
</tr>
<tr>
<td>Kātaka.</td>
<td>The children of the Water.</td>
<td>32</td>
<td>...</td>
<td>Its (?) are united, and it is shining like the moon.</td>
<td></td>
<td>It bodes much fear and evil in Pundra.</td>
</tr>
<tr>
<td>Kabandha.</td>
<td>The children of the Time.</td>
<td>...</td>
<td>9</td>
<td>Like the cut-off head of a man.</td>
<td>In all directions.</td>
<td>It bodes much destruction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>One in appearance, nine in number. White, large.</td>
<td></td>
<td>It bodes pestilence.</td>
</tr>
</tbody>
</table>
The author (Varāhamihira) had divided the comets into three classes: the high ones near the stars; the flowing ones near the earth; the middle ones in the air, and he mentions each one of the high and middle classes of them in our table separately.

He further says (chap. xi. 42):—

"If the light of the middle class of comets shines on the instruments of the kings, the banners, parasols, fans, and fly-flaps, this bodes destruction to the rulers. If it shines on a house, or tree, or mountain, this bodes destruction to the empire. If it shines on the furniture of the house, its inhabitants will perish. If it shines on the sweepings of the house, its owner will perish."

Further Varāhamihira says (chap. xi. 6):—

"If a shooting-star falls down opposite to the tail of a comet, health and wellbeing cease, the rains lose their beneficial effects, and likewise the trees which are holy to Mahādeva—there is no use in enumerating them, since their names and their essences are unknown among us Muslims—and the conditions in the realm of Cola, Sita, the Huns and Chinese are troubled."

Further he says (chap. xi. 62):—

"Examine the direction of the tail of the comet, it being indifferent whether the tail hangs down or stands erect or is inclined, and examine the lunar station, the edge of which is touched by it. In that case predict destruction to the place and that its inhabitants will be attacked by armies which will devour them as the peacock devours the snakes.

"From these comets you must except those which bode something good.

"As regards the other comets, you must investigate in what lunar stations they appear, or in what station their tails lie or to what station their tails reach. In that case you must predict destruction to the princes of those countries which are indicated by the lunar
stations in question, and other events which are indicated by those stations."

The Jews hold the same opinion regarding the comets as we hold regarding the stone of the Ka'ba (viz. that they all are stones which have fallen down from heaven). According to the same book of Varahamihira, comets are such beings as have been on account of their merits raised to heaven, whose period of dwelling in heaven has elapsed and who are then descending to the earth.

The following two tables embody the Hindu theories of the comets:——
<table>
<thead>
<tr>
<th>No.</th>
<th>Comet</th>
<th>Orientation</th>
<th>Description</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vasā.</td>
<td>West</td>
<td>It is flashing and thick, and extends itself from the north.</td>
<td>It bodes death and excessive wealth and fertility.</td>
</tr>
<tr>
<td>2</td>
<td>Asthi.</td>
<td>West</td>
<td>Less bright than the first.</td>
<td>It bodes hunger and pestilence.</td>
</tr>
<tr>
<td>3</td>
<td>Śastra.</td>
<td>West</td>
<td>Similar to the first.</td>
<td>It bodes the fighting of the kings with each other.</td>
</tr>
<tr>
<td>4</td>
<td>Kapālaketa.</td>
<td>East</td>
<td>Its tail extends till nearly the midst of heaven. It has a smoke-colour and appears on the day of new-moon.</td>
<td>It bodes the abundance of rain, much hunger, illness and death.</td>
</tr>
<tr>
<td>5</td>
<td>Raudra.</td>
<td>From the east in Pūrvāshūḍha, Pūrvabhādrapāda, and Revati.</td>
<td>With a sharp edge, surrounded by rays. Bronze-coloured. It occupies one-third of heaven.</td>
<td>It bodes the fighting of the kings with each other.</td>
</tr>
<tr>
<td>6</td>
<td>Calaketa.</td>
<td>West</td>
<td>During the first time of its appearance it has a tail as long as a finger towards the south. Then it turns towards the north, till it becomes as long as to the south, the Great Bear and the Pole, then the Falling Eagle. Rising higher and higher it passes round to the south and disappears there.</td>
<td>It ruins the country from the tree Prayāga till Ujjayin. It ruins the Middle Country, whilst the other regions fare differently. In some places there is pestilence, in others drought, in others war. It is visible between 10-12 months.</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Direction</td>
<td>Description</td>
<td>Meaning</td>
</tr>
<tr>
<td>-----</td>
<td>------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>Śvetaketu.</td>
<td>South</td>
<td>It appears at the beginning of night and is visible during seven days. Its</td>
<td>When these two comets shine and lighten, they bode health and wealth.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>tail extends over one-third of heaven. It is green and passes from the right</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>side to the left.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Ka.</td>
<td>West</td>
<td>It appears in the first half of night, its flame is like scattered peas, and</td>
<td>It ruins all human affairs and creates numerous revolutions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>remains visible during seven days.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Raśmiketu(?)</td>
<td>The Pleiades</td>
<td>It has the colour of smoke.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Dhruvaketu(?)</td>
<td></td>
<td>It has a big body, it has many sides (?) and colours, and is bright flashing.</td>
<td>It bodes health and peace.</td>
</tr>
<tr>
<td>Their number</td>
<td>Their names</td>
<td>From what direction they appear</td>
<td>Description</td>
<td>Their prognosis</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------</td>
<td>---------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Kumuda</td>
<td>West</td>
<td>Namesake of the lotus, which is compared with it. It remains one night, and its tail is directed towards the south.</td>
<td>It bodes lasting fertility and wealth for ten years.</td>
</tr>
<tr>
<td>2</td>
<td>Maniketu</td>
<td>West</td>
<td>It lasts only one quarter of a night. Its tail is straight, white, similar to the milk which spurts out of the breast when it is milked.</td>
<td>It bodes a great number of wild animals and perpetual fertility during four and a half months.</td>
</tr>
<tr>
<td>3</td>
<td>Jalaketu</td>
<td>West</td>
<td>Flashing. Its tail has a curve from the west side.</td>
<td>It bodes fertility and well-being of the subjects during nine months.</td>
</tr>
<tr>
<td>4</td>
<td>Bhavaketu</td>
<td>East</td>
<td>It has a tail like that of a lion towards the south.</td>
<td>It is visible only one night. It bodes perpetual fertility and well-being during as many months as its appearance last mūhāras. If its colour becomes less bright, it bodes pestilence and death.</td>
</tr>
<tr>
<td>Their number</td>
<td>Their names</td>
<td>From what direction they appear</td>
<td>Description</td>
<td>Their prognostics</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>---------------------------------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>5</td>
<td>Padmaketu.</td>
<td>South.</td>
<td>It is as white as the white lotus. It lasts one night.</td>
<td>It bodes fertility, joy, and happiness for seven years.</td>
</tr>
<tr>
<td>6</td>
<td>Avarta.</td>
<td>West.</td>
<td>It appears at midnight, bright shining and light gray. Its tail extends from the left to the right.</td>
<td>It bodes wealth during as many months as its appearance lasts mukūrtas.</td>
</tr>
<tr>
<td>7</td>
<td>Samvarta.</td>
<td>West.</td>
<td>With a tail with a sharp edge. It has the colour of smoke or bronze. It extends over one-third of heaven, and appears during the samāha.</td>
<td>The lunar station in which it appears becomes unlucky. It ruins as well that which it bodes, as the lunar station. It bodes the unsheathing of the weapons and the destruction of the kings. Its influence lasts as many years as its appearance lasts mukūrtas.</td>
</tr>
</tbody>
</table>
This is the doctrine of the Hindus regarding the comets and their presages.

Only few Hindus occupy themselves in the same way as physical scholars among the ancient Greeks did, with exact scientific researches on the comets and on the nature of the other phenomena of heaven (rā ṛetēopa), for also in these things they are not able to rid themselves of the doctrines of their theologians. Thus the Matsya-Purāṇa says:—

"There are four rains and four mountains, and their basis is the water. The earth is placed on four elephants, standing in the four cardinal directions, which raise the water by their trunks to make the seeds grow. They sprinkle water in summer and snow in winter. The fog is the servant of the rain, raising itself up to it, and adorning the clouds with the black colour."

With regard to these four elephants the Book of the Medicine of Elephants says:—

"Some male elephants excel man in cunning. Therefore it is considered a bad omen if they stand at the head of a herd of them. They are called manguniha (?). Some of them develop only one tooth, others three and four; those which belong to the race of the elephants bearing the earth. Men do not oppose them; and if they fall into a trap, they are left to their fate."

The Vāyu-Purāṇa says:—

"The wind and the sun's ray raise the water from the ocean to the sun. If the water were to drop down from the sun, rain would be hot. Therefore the sun hands the water over to the moon, that it should drop down from it as cold water and refresh the world."

As regards the phenomena of the sky, they say, for instance, that the thunder is the roaring of Airāvata, i.e., the riding-elephant of Indra the ruler, when it drinks from the pond Mānasa, rutting and roaring with a hoarse voice.
The rainbow (lit. bow of Kuzah) is the bow of Indra, as our common people consider it as the bow of Rustam.

Conclusion. We think now that what we have related in this book will be sufficient for any one who wants to converse with the Hindus, and to discuss with them questions of religion, science, or literature, on the very basis of their own civilisation. Therefore we shall finish this treatise, which has already, both by its length and breadth, wearied the reader. We ask God to pardon us for every statement of ours which is not true. We ask Him to help us that we may adhere to that which yields Him satisfaction. We ask Him to lead us to a proper insight into the nature of that which is false and idle, that we may sift it so as to distinguish the chaff from the wheat. All good comes from Him, and it is He who is clement towards His slaves. Praise be to God, the Lord of the worlds, and His blessings be upon the prophet Muhammad and his whole family!
ANNOTATIONS.

VOL. I
ANNOTATIONS.

VOL. I.

P. 1. Title.—The author proposes to investigate the reality (=
ḥabīka) of Hindu modes of thought in the entire extent of the sub-
ject. He describes the religious, literary, and scientific traditions of India, not the country and its in-
habitants. However, in some chapters he gives more than the title promises; cf. his notes on the roads and on
the courses of the rivers.

The contents of the eighty chapters of the book may be
arranged under the following heads:—


Chap. 2–11. On Religious, Philosophical, and cognate
subjects.

Chap. 12–17. On Literature and Metrology, Strange
Customs and Superstitions.

Chap. 18–31. On Geography, Descriptive, Mathemati-
cal, and Traditional, i.e. Pauranic.

Chap. 32–62. On Chronology and Astronomy, inter-
spersed with chapters of Religious Tradition, e.g. on Nārā-
yāna, Vāsudeva, &c.

Chap. 63–76. On Laws, Manners and Customs, Festivals
and Fast Days.


The word makūla, translated by category, is a technical
term of Arabian philosophy. It was coined by the first
Arabian translators of Aristotle for the purpose of render-
ing κατηγορία, and has since become current in the school
language of Islam (cf. the Arabic title of Aristotelis Cate-
goriarum Graece cum versione Arabica, &c., edid. J. Th. Zenker,
Lipsiae, 1846). The Syrian predecessors of those Arabian
translators had simply transferred the Greek word just as
it is into their own language; cf. e.g. Jacob of Edessa in G. Hoffmann's De Hermeneuticis apud Syros Aristoteleis, Lipsiae, 1869, p. 17.

That a Muslim author should investigate the ideas of idolaters, and not only such as Muslims may adopt, but also such as they must reject and condemn, that he quotes the Koran and the Gospel side by side (p. 4-5), is a proof of a broadness of view and liberality of mind more frequently met with in the ancient times of Islam, in the centuries before the establishment of Muhammadan orthodoxy by Alghazzâlî (died A.D. 1111), than later. There was more field for utterances of mental individuality before the ideas of all the nations of Islam were moulded into a unity which makes it difficult to recognise the individual influences of every single nation on the general development of the Muhammadan mind, before all Islam had become one huge religious community, in which local and national differences seem to have lost most of their original importance for the spiritual life of man. The work of Alberuni is unique in Muslim literature, as an earnest attempt to study an idolatrous world of thought, not proceeding from the intention of attacking and refuting it, but uniformly showing the desire to be just and impartial, even when the opponent's views are declared to be inadmissible. There can be hardly a doubt that under other circumstances, in other periods of Muslim history and other countries, the present work might have proved fatal to its author; and it shows that the religious policy of King Mahmûd, the great destroyer of Hindu temples and idols, under whom Alberuni wrote, must have been so liberal as to be rarely met with in the annals of Islam (cf. pp. 268, 269).

P. 5. The master Abû-Sahl, &c.—Al-tiflisî, i.e. a native of Tiflis in the Caucasus, is not known from other sources. I suppose he was one of the high civil functionaries of the realm or court of Mahmûd. The name Sahl occurs very frequently among men of Persian descent of those times, and the title Usâdâh = master, is in the Ta'rikh-i-Baihaki always prefixed, if not precisely as an official title, at all events as a title expressive of profound respect on the part of the speaker, to the names of the ministers and
highest civil officials of Maḥmūd and Mašūd, such as Bā Sahl Zauzant, Bā Sahl Ḥamdūn, Bā Naṣr Mushkān, the minister of state, whose secretary Al-baihakī was, as well as to the name of Alberuni (^
, 16), but never to the names of the great military men (cf. on titles in the Ghaznawi empire, A. de Biberstein Kazimirski, Menoutchehret, Paris, 1887, p. 308). Administrative skill was a legacy left by the organisation of the Sasanian empire to the Persians of later centuries, whilst military qualities seem entirely to have disappeared among the descendants of Rustam. For all the generals and officers of Maḥmūd and Mašūd were Turks, as Altuntash, Arslan Jādıhib, Arıyarok, Bagtagin, Bilkatagin, Niyaltagin, Noshtagin, &c. The Ghazna princes spoke Persian with their civil functionaries, Turkish with their generals and soldiers (cf. Elliot, History of India, ii. 81, 102).

P. 5. The Mu'tazila sect.—The dogma, God has no knowledge, is part of their doctrine on the qualities of God, maintained especially by Ma'mar Ibn 'Abbād Al-Salami. (Cf. on this and related subjects the treatise of H. Steiner, Die Mutaziliten oder die Freidenker im Islam, Leipzig, 1865, pp. 50, 52, 59, and Al-Shahrastāni’s “Book of Religious and Philosophical Sects,” edited by Cureton, London, 1846, p. 30, ll. 7–9). Proceeding from the study of Greek philosophy, the doctors of this school tried to save the free will of man as against predestination. There was once in Arabic a large literature composed by them and by their opponents, most of which is unknown, at all events not yet brought to light. Most of these books were of a polemical nature, and it is against their polemical bias that the criticism of Alberuni is directed. With regard to his own work, he expressly declares (p. 7) that it is not a polemical one. The book which Abū-Sahl had before him, and which gave rise to the discussion between him and our author, was probably one like that of Abūl-ḥasan Al-'ash'ari (died a.d. 935), the great predecessor of Alghazzālī, “On the Qualities of God,” in which he attacks the Mu'tazila doctrine of the negation of God’s omniscience. (Cf. W. Spitta, Zur Geschichte Abūlḥasan Al-'Ash'ari's, Leipzig, 1876, p. 64.) The same author has also written an extensive work against the antagonists of
the orthodox faith, against Brahmins, Christians, Jews, and Magians (v. ib. p. 68).

Our information regarding the ancient literature on the history of religion and philosophy (the latter proceeding from a work of the Neoplatonist Porphyrius) is very scanty, and mostly limited to titles of books. The work of Shahrastānī (died A.D. 1153) is a late compendium or "Net" (v. his pref., i, 8). His editor, Cureton, intended to give "Observations respecting the sources from which this author has probably derived his information" (English pref., p. iv.), but, as far as I am aware, he has not carried out his intention. There is an excellent treatise on the history of religions in the Fihrist of Al-nadim (composed about A.D. 987) on p. 78-91. The same author mentions (p. 110v) an older work on doctrines and religions by Alīṣan Ibn Mūsā Alnaubakhtī (mentioned by Mas'ūdī), who also wrote against metempsychosis. Parts of a similar work of Ibn Ḥazm, an Arab of Spain (died A.D. 1064), are extant in the libraries of Vienna and Leyden. Mr. C. Schefer has recently published in his Chrestomathie Persane, Paris, 1883, a useful little book in Persian called کتاب بيان آداب کبیر, composed by Abul-Ma'āli Muhammad Ibn 'Ukail, who wrote in Ghazna, under the king Mas'ūd Ibn Ibrāhīm (A.D. 1089-1099), half a century after Alberuni, whose Indica he quotes in his book. He calls it "The Doctrines of the Hindus" (p. 136). Two more treatises on Persian on the history of religions are mentioned by C. Schefer, Chrestomathie Persane, pp. 136, 137.

An author who seems to have written on subjects connected with the history of religions is one Abū-Ya'kūb of Sijistān, as Alberuni (i. 64-65) quotes his theory on the metempsychosis from a book of his, called Kīābd-kashf-almakhdūb.

Pp. 6-7. Alérānshahri and Zurkān.—Our author has not made any use of the Muhammadan literature on the belief of the Hindus, as far as such existed before his time; evidently he did not give it the credit of a bond fide source of historical information. Throughout his book he derives his statements exclusively either from Indian books or from what he had heard himself. He makes an exception of this rule only in favour of Alérānshahri, the
author of a general work on the history of religions. Alberuni seems to have known this book already (A.D. 1000) when he wrote his "Chronology," for there he gives two quotations, one an Eranian, and the other an Armenian tradition, on the authority of Ālērānshahrī (v. "Chronology of Ancient Nations," &c., translated by Dr. C. Edward Sachau, London, 1879, pp. 208, 211).

The word Ėrānshahrī was known to the Arabs as the name of the whole Sasanian empire, from the Oxus to the Euphrates. So it is used, e.g. by Abū-Ḥāṯīr Ibn 'Umar Ibn Dusta in his geographical work (British Museum, add. 23,378 on fol. 120b), where he describes the whole extent of it. If, however, Ėrānshahrī here means the place where the author Ābulabbās was born, we must take the word in the more restricted meaning, which is mentioned by Albaladāhīrī. For it is also the name of a part of the Sasanian empire, viz. one of the four provinces of Khurāsān, the country between Nishāpur, Tūs, and Herāt. Accordingly, we suppose that Ālērānshahrī means a native of this particular province. Cf. Almuḵaddasī, p. ۴۸۷, Yāḵūţ, i. ۵۸۷. According to another tradition, the name Ėrānshahrī also applied to Nishāpur, i.e. the name of the province was used to denote its capital. Cf. Almuḵaddasī, p. ۴۸۷.

 недоукин, a sort of freethinker according to Alberuni, is only once quoted (i. 326, a Buddhistic tradition on the destruction and renovation of the world). But as Alberuni praises his description of Judaism, Christianity, and Manichaeism, we may suppose that the information of the Indica on these subjects, e.g. the quotation from the Gospel (p. 4-5), was taken from Ėrānshahrī.

Incorporated in the work of Ėrānshahrī was a treatise on Buddhism by an author, Žūrkān, who is entirely unknown. Although Alberuni speaks very slightingly of this author, and although he does not mention him anywhere save in the preface, he seems to have borrowed from him those notes on Buddhistic subjects which are scattered through his work (v. Index Rerum, s.v. Buddhists). This sort of information is not of a very high standard, but other sources on Buddhism, literary or oral, do not seem to have been at the command of Alberuni. The Hindus with whom he mixed were of the Brahminical
creed, not Buddhists. In the countries where he had lived, in Khwârîzma, Jurjân, the country round Ghazna (Zâbulistân), and the Panjâb, there had been no opportunity for studying Buddhism; and also among the numerous soldiers, officers, artisans, and other Indians in the service of Mahmûd in Ghazna and other places, there do not seem to have been Buddhists, or else Alberuni would have used such occasions for filling out this blank in his knowledge.

In the Fihrist (ed. G. Flügel, Leipzig 1871), on p. 474, there is an extensive report on India and China, which is derived from the following sources:

1. The account of Abû-Dulaf of Yanbû, who had travelled to India and China about A.D. 941.

2. That of a Christian monk from Najrân, who by order of the Nestorian Katholikos had also travelled to India and China in the years A.D. 980–987.

3. From a book dated A.D. 863, of an unknown author, a book which had passed through the hands of the famous Alkindî. Was this perhaps the work of Alârânshahîf, and the note on Buddha on p. 47v by Zurkân?

The origin of the chapter on Indian subjects in Shah-rastâni (ed. Cureton, London, 1846), on p. 47r seq. is not known. At all events, this author has not made use of Alberuni's work.

Pp. 7–8. Greeks, Sûfis, Christians.—In order to illustrate the ideas of the Hindus, and to bring them nearer to the understanding of his Muslim readers, Alberuni quotes related ideas—

1. Of the Greeks (cf. i. 24).
2. The Christians.
3. The Jews.
4. The Manichaeans; and
5. The Sûfis.

Pantheism in Islam, the doctrine of the Sûfis, is as near akin to the Neoplatonic and Neopythagorean schools of Greek philosophy as to the Vedânta school of Hindu philosophers. It was in our author's time already represented by a very large literature. He quotes some Sûfi sentences, e.g. of Abû Bakr Al-shâbi, and Abû Yazid Albistâmi, who are known from other sources (i. 87, 88),
ANNOTATIONS.

and a Sufi interpretation of a Koranic passage (i. 88). Cf. besides, the Index Rerum s.v. Sufism. He gives i. 33, 34, several etymologies of the word Sufi, which he himself identifies with Σωφία.

The notes relating to Mâni and the Manichaeans (v. Index Rerum), and the quotations from their books, are probably mostly taken from Alârânsahri (v. p. 18). However, it must be kept in mind that, at the time of our author, the works of Mâni still existed, and he himself found the “Book of Mysteries” and others in his native country, though perhaps at a time subsequent to the date of the composition of the Indica. Cf. Chronologie Orientalischer Völker. herausgegeben von Ed. Sachau, Leipzig, 1878, Vorwort, pp. xi. and xxxvi. The following works of Mâni are quoted: “Book of Mysteries,” كتاب كتب الأحياءʾ; Thesaurus vivificationis, i. 39. Cf. Mani, seine Lehre und seine Schriften, by G. Flügel, Leipzig, 1862.

As regards the Jews, I am not informed to what degree Jewish colonies were in those times spread over Central Asia. Alberuni derived probably his knowledge of Judaism also from Alârânsahri (p. 253). That in earlier years, during his stay in Jurjân, he was acquainted with a Jewish scholar is apparent from his chronological work (“Chronology of Ancient Nations,” p. 260).

Alberuni’s knowledge of Christianity may have been communicated by various channels besides the book of his predecessor Alârânsahri, as during his time it was far spread in Central Asia, and even at the court of Mahmûd in Ghazna (e.g. Abulhâir Alkhammad, p. 256), there lived Christians. It has not yet been investigated in detail how far Nestorian Christianity had been carried eastward across Central Asia towards and into China. Cf. Assemani’s Notitia Ecclesiarum Metropolitarum et Episcopaliuin qua sunt Patriarchæ Nestoriano Subjectæ (Bibliotheca Orientalis, vol. iv. p. dccc. seq.). Barhebræus speaks of Uigûr monks .InputStream (ib. ii. 256), and from the same time date some of the Syriac inscriptions on Christian tombstones recently found in Russian Central Asia and published in Petersburg, 1886. Alberuni mentions Christians in his native country Khwârizm (Khiva), and in Khurâsân, and not only Nestorians, but also Mel-
kites, whilst he expressly states that he does not know the Jacobites. Cf. "Chronology of Ancient Nations," pp. 283, 4; 292, 12; 295, 22; 312, 16.

Where Alberuni learned Greek philosophy, and who introduced him to the study of Plato’s Dialogues and Leges, he does not state himself. The Arabic translations which he used, and which are tolerably correct, had passed through Syriac versions which are now no longer extant (e.g. those of Plato). Alberuni was personally acquainted and had literary connections with a man who was one of the first representatives of Greek learning in the Muslim world in that age, Abulkhair Alkhammâr, and it was perhaps to him that Alberuni owed part of his classical education. Abulkhair was born a Christian in Bagdad, A.H. 942. He lived some time in Khwârizm, and migrated thence, together with Alberuni and others, to Ghazna, A.D. 1017, after Maḥmûd had annexed that country to his empire. He died in Ghazna during Maḥmûd’s reign, i.e. before A.D. 1030, and is said to have become a Muslim towards the end of his life. He was a famous physician, and wrote on medical subjects and on Greek philosophy; besides he translated the works of Greek philosophers (e.g. Theophrast) from Syriac into Arabic. Of his writings we may mention a "Book of Comparison of the Theory of the (Greek) Philosophers and of the Christians," "Explanation of the Theory of the Ancients (i.e. Greek philosophers) regarding the Creator and regarding Laws," "The Life of the Philosopher," "On the ἀληθή," "On Meteorology," &c. His pedigree points to a Persian descent. Cf. Chronologie Orientalischer Völker, Einleitung, p. xxxii., Führer, p. 370, and the work of Shahrazûrî نه از الرازی (manuscript of the Royal Library of Berlin, MSS. Orient. oct. 217, fol. 144b–146a); O. Schefer, Christo-mathie Persane, p. 141.

It must be observed that Alberuni, in comparing Hindu doctrines with those of Plato, follows in the wake of Megasthenes, who says: Παραπλέκουσι δὲ καὶ μύθους, ὃστερ καὶ Πλάτων, περὶ τε ἀφθαρσίας ψυχῆς καὶ τῶν καθ’ ἄδου κρίσεων καὶ ἄλλα τοιαύτα (Schwanbeck, Bonn, 1846, p. 138).

P. 8. Sāṅkhya (or Sāṅkhyā) and Pātañjala.—The
former word is here written 

It may be doubtful whether the second is to be read Patañjala or Patañjali. Alberuni generally says كتاب بانجل, which may be translated the book of (the author) Patañjali, or the book (which is called) Patañjali or Patañjala. Only in one place, i.e., 68 (३४, ५), he says صاحب كتاب بانجل, the author of the book of Patañjali, where apparently بانجل means the title of the book, not the name of the author. The long a in the Arabic writing would rather indicate the pronunciation Patañjala than Patañjali, but in this respect the transliteration is not always uniform, as sometimes a short Indian a has been rendered by a long a in Arabic, e.g., 

tala, پراهم brahman, کاندھرب gandharva, مادھyaloka, سوتala, یجیاند para, بار vasu, مهانال mahâtala. Only in two places the word بانجل evidently means the author, i.e., 70 (३४, २०), and 87 (३४, ३). The name of the author seems to have been current also as meaning his book. Therefore, and because in Sanskrit generally the name Patañjali is quoted, I have given the preference to the latter form of the name.

Alberuni has transferred large portions of his translations of the books Sāṅkhya and Patañjali, which he had published at an earlier date, into the Indica.

Pp. 17–19.—In a similar way to Alberuni, the poet Mir Khusrau discourses on classical and vernacular in his Nuh-sipihr. He mentions the word Sanskrit, whilst Alberuni only speaks of Hindi (v. Elliot, "History of India," iii. 562, 556; also v. 570, "On the Knowledge of Sanskrit by Muhammadans").

There were Hindu dragomans in the service of Mahmûd, both in the civil administration and in the army, large portions of which were Hindus under Hindu officers (Elliot, ii. 109; some fought in Karmân, Khwârizm, and before Merw for their Muslim master, ib. ii. 130, 131). Part of these troops were Kannara, i.e. natives of Karnâ-ṭadeša (here i. 173).

A specimen of these interpreters is Tilak, the son of Jai Sen (i.e., Tilaka the son of Jayasena). After having pursued his studies in Kashmir, he became interpreter first to Kâdi Shârâzi Bulhâsan ʿAli, a high civil official under
Maḥmūd and Maṣʿūd (Elliot, ii. 117, 123), then to Aḥmad Ibn Ḥasan of Maimān, who was grand vizir, A.D. 1007–1025, under Maḥmūd, and a second time, 1030–1033, under Maṣʿūd, and rose afterwards to be a commanding officer in the army (Elliot, ii. 125–127). This class of men spoke and wrote Hindi (of course with Arabic characters) and Persian (perhaps also Turkish, as this language prevailed in the army), and it is probably in these circles that we must look for the origin of Urdu or Hindustānī. The first author who wrote in this language, the Dante of Muhammadan India, is one Maṣʿūd, who died a little more than a century after the death of King Maḥmūd (a.h. 525 = a.d. 1131). Cf. A. Sprenger, "Catalogue of the Arabic, Persian, and Hindustany Manuscripts of the Libraries of the King of Oudh," Calcutta, 1854, pp. 407, 485. If we had any of the Hindi writings of those times, they would probably exhibit the same kind of Indian speech as that which is found in Alberuni's book.

P. 18.—The bearing of the words َمَحَمْد َمَسْعُود (9, 14, 15), which I have translated "and must pronounce the case-endings either," &c., is doubtful. The word َمَحَمْد means the process or mode of Arabizing a foreign word, and refers both to consonants and vowels. An َمَحَمْد mashhār would be a generally known Arabic mode of pronunciation of a word of Indian origin, an َمَحَمْد māmul such a pronunciation of an Indian word in Arabic as is not yet known, but invented for the purpose. E.g. the Sanskrit word َدِلَٰپ appears in two different forms, as َدِلَب, which must be classed under the first head, and as َدِلَب, which belongs to the second class. If it is this the author means, we must observe that the former class, i.e. the class of words which had already general currency in Arabic before he wrote his Indica, is insignificantly small in comparison with the large number of words which by Alberuni were for the first time presented to a reader of Arabic (v. preface of the edition of the Arabic original, p. xxvii.).

Another meaning of the word َمَحَمْد is the vowel-pronunciation at the end of the words, chiefly the nouns; in fact, the case-endings. Accordingly, َمَحَمْد mashhār may mean case-ending (in German, vocalischer Auslaut) as it is gene-
rally used in Hindi, e.g. गुड़, रवति, revati, and 'वर्ध मामुल, a case-ending added to a word purposely in order to make it amenable to the rules of Arabic declension (diptoton and triptoton), e.g. लंकु = Skr. lankha, गौरु = Skr. Gauri, बिंदु = Skr. Vindhya. The vocalisation of these words is liable to lead us into an error. Is बन्द an Arabic diptoton, or is its final vocal the termination of the noun in Hindi? If the former were the case, we ought also to have बन्द in genitive and accusative, and we ought to read वर्ण a caste (varna), अमल an impure one (mlechha), माप a measure (mâna), &c. But these forms do not occur in the manuscript, and therefore I hold the termination ु to be the Indian nominative, developed out of the े of Prakrit, and still extant in Sindhi. (Cf. E. Trumpp, Die Stammbildung des Sindhi, "Journal of the German Oriental Society," xvi. p. 129; his "Grammar of the Sindhi Language," p. 32). The Arabic manuscript is not sufficiently accurate to enable us to form an opinion to what extent names in Alberuni’s Hindi terminated in ु, but we must certainly say that this is the case in the vast majority of nouns. If we are correct in this, the term वर्ध मामुल cannot mean an artificial case-ending or one invented or added for the purpose, because it existed already in the Indian dialect whence Alberuni took the word.

Of the words अमल, the former half refers to the writing of the consonants (and perhaps of the Lesexeichen). Accordingly the latter half ought to refer to the vowels; but वर्ध does not mean vowels or vocalisation; it only means the vocalisation of the final consonant of the word. Therefore I am inclined to prefer the first of the two interpretations here proposed, and to translate for in order to fix the pronunciation we must change the points (i.e. the diacritical points of the consonants, راء, ز, ز ز, و, &c.) and the signs (perhaps he means the Hamza, which cannot be applied to Indian sounds), and must secure its correct pronunciation by such a process of Arabizing as is either already in general use or is carried out (or invented) for the purpose. This is an example (and there are hundreds more) of the concise style of the author, so sorely fraught with
ambiguity. Every single word is perfectly clear and certain, and still the sentence may be understood in entirely different ways.

P. 19. 3. Which in our Persian grammatical system are considered as, &c.—Literally, “Which our companions call having,” &c. Speaking of his fellow-Muslims in opposition to the Hindus, the author always says our companions, our people, not meaning national differences, Arab, Persian, or Turk, but exclusively the difference of creed.

In Sanskrit a word (a syllable) may commence with one, two, or three consonants, e.g. dvi, jyā, strī, kśveṇa, which is impossible in Arabic, where each syllable begins and ends with one consonant only. Alberuni’s comparison cannot, therefore, refer to Arabic.

In Persian, the rules for the beginning and end of the syllable are different. Whilst in the ancient forms of Eranian speech a syllable could commence with two consonants, as, e.g. fratama, khsopa, Neo-Persian permits only one consonant at the beginning of a syllable, fardum, shab. However, the end of a syllable may consist of two consecutive consonants, as in yāft, baksh, khusht, marād, &c. Alberuni seems to hint at these examples, and at a doctrine of certain grammarians, who are not known, to this effect, that the first of these two consonants is to be considered as having not a complete or clear vowel, but an indistinct hidden one, something like a schwa mobile of Hebrew grammar.

There is a small number of words (or syllables) in Neo-Persian which indeed commence with the two consonants خو, خو, as, e.g. خوام حور, هوام حور, خور, خو, but they were at the author’s time pronounced as a single one, if we may judge from the metrical system of the Shāhndāma of his contemporary Firdausi, who was only a little older than himself. (Cf. similar remarks of the author, i. 138, 139.)

P. 20. Sagara.—The story of Sagara is related in Vishnu-Purāṇa, translated by Wilson-Hall, vol. iii. p. 289–295. The words and نکردن فدل آل ی and نکردن بهمهم might make us think that these events happened within the recollection of the author; but this is not necessarily the case. The former words may be interpreted, “I recollect the story
of a Hindu who,” &c., i.e. “I recollect having heard the story,” &c.; and the words with which he winds up the story may mean, “I feel thankful to my fate that it was not I and my contemporaries whom he treated thus, but former generations.”

P. 21. Shamaniyya.—The Buddhists are in Arabic called by this name, which is derived from a Prakritic form of Sanskrit śramaṇa (Strabo ᾶκρμαν, Hieronymus Samanac), and by the word المَسَحِّرة i.e. the red-robed people (= raktapata), which refers to the red-brown (= kṣhāya) cloaks of the Buddhist monks. Cf. Kern, Der Buddhismus und seine Geschichte in Indien, übersetzt von H. Jacobi, Leipzig, 1882, ii. 45. See another note of our author on Buddhism in his “Chronology of Ancient Nations,” pp. 188, 189. It is extremely difficult, from the utter lack of historic tradition, to check the author’s statements as to the western extension of Buddhism, which certainly never reached Mosul. Before all, it will be necessary to examine how far Alberuni, when speaking of the ancient history and institutions of Eran, was under the influence of the poets of his time, Dakīkt, Asatī, and Firdausī, who versified Eranian folklore for the edification of the statesmen of the Samanian and Ghaznavi empires, all of them of Eranian descent. Hearing the songs of the heroic exploits of their ancestors consoled them to a certain degree for the only too palpable fact that their nation was no longer the ruling one, but subject to another; that Arabs and Turks had successively stepped into the heritage of their ancestors.

It must be observed that the negotiators of the cities of Sindh, whom they sent to the Muslim conquerors when first attacked by them, were invariably śramaṇas (v. Albaladhuri), which seems to indicate that Sindh in those times, i.e. about A.D. 710, was Buddhistic. Cf. H. Kern, Der Buddhismus und seine Geschichte in Indien, ii. 543.

P. 21. Muhammad Ibn Alkāsim.—The brilliant career of the conqueror of Sindh falls into the years A.D. 707–714. By Albaladhuri (p. 419), Ibn-Al’athīr, and others he is called Muh. Ibn Alkāsim Ibn Muhammad, not Ibn Almunabbih, as here and p. 116. When Alberuni wrote,
Islam was known in Sindh already 350 years (since A.D. 680), and was established there 320 years (since about A.D. 710). On the history of the conquest of Sindh, cf. Albaladhi's Kitāb-al-futūḥ, p. 111, translated by Reinaud, “Fragments,” p. 182; Elliot, History of India, i. 113.

Instead of Bahmanvā read Brahmanavata.

P. 23. The words of Varāhamihira are found in his Brihat-Samhita, translated by Kern in the “Journal of the Royal Asiatic Society,” 1870, p. 441 (ii. 15): “The Greeks, indeed, are foreigners, but with them this science is in a flourishing state. Hence they are honoured as though they were Rishis; how much more then a twice-born man, if he be versed in astrology.”

P. 25. Think of Socrates, &c.—The author speaks of a Socratic fate or calamity, meaning a fate like that which befell Socrates. I do not know from what particular source Alberuni and his contemporaries derived their information about the history of Greek philosophy. There is a broad stream of literary tradition on this subject in Arabic literature, but it has not yet been investigated what was its origin, whether it proceeded from one source or from several. Those men, mostly Greek heathens from Harrān or Syrian Christians, who had enjoyed the Greek education of the time, not only translated Greek literature into Syriac and Arabic for the benefit of their Arab masters, but wrote also general works on the history of Greek learning and literature, probably translating and adopting for their purpose some one of the most current schoolbooks on this subject, used in the schools of Alexandria, Athens, Antioch, &c. Among authors who wrote such books, some being mere compilations of the famous sentences of Greek sages (doxographic), others having a more historic character, are Ḥunain Ibn 'Isḥāk, his son 'Isḥāk Ibn Ḥunain, and Kusṭā Ibn Lūkā (i.e. Constans the son of Lucas). But what were the Greek works from which they took their information, and which they probably communicated to the Arabs exactly as they were? I am inclined to think that they used works of Porphyrius and Ammonius, the Greek originals of which are no longer extant.
P. 25. *Jurare in verba, &c.*—The Hindus consider, e.g. the sciences of astronomy and astrology as *founded upon tradition*, and their authors produce in their books side by side their own perhaps more advanced ideas and some silly notions of any predecessors of theirs, although they are fully aware that both are totally irreconcilable with each other. *Cf.* the words of Varāhamihira to this effect in *Brihat Samhita*, ix. 7, and the note of his commentator Utpala to v. 32. Alberuni pronounces most energetically against this kind of scientific composition when speaking of Brahmagupta in chapter lx. on eclipses.

P. 27. *Beyond all likeness and unlikeness*, an expression frequent in the description of the Deity. Literally translated: *things that are opposite to each other and things that are like each other.* Perhaps the rhyme *didd* and *nidd*, *awdd* and *anddd*, has contributed to the coining of this term. As for the idea, it may be compared with the term *dvandvas* in Hindu philosophy = *pairs of opposites*, as pleasure and pain, health and sickness. *Bhagavad-Gītā*, ii. 45, vii. 27; *"Yoga Aphorisms of Patañjali*” (edited by Rajendralālā Mitra), ii. 48, p. 111.

P. 27. *Who is the worshipped one? &c.*—The greater part of this extract from Patañjali has been translated into Persian by Abulma'āli Muḥammad Ibn 'Ubaid-Allāh in his *KITĀB-BAYĀN-AL-'ADYĀN*; v. C. Schefer, *Chrestomathie Persane*, i. 132, 136, 138.

P. 27. *Patañjali.*—The book of this name used and translated by the author had the form of a conversation between two persons, simply called "the asking one," and "the answering one," and its subject was the search for liberation and for the union of the soul with the object of its meditation (i. 132), the emancipation of the soul from the fitters of the body (i. 8). It was a popular book of theosophy, propounding in questions and answers the doctrine of the Yoga, a theistic philosophy developed by Patañjali out of the atheistic Sāṁkhya philosophy of Kapila. *Cf.* J. Davies, "Hindu Philosophy," *Sāṁkhya Karika of Iksara Krishṇa*, London, 1881, p. 116. The latter is called *nirūvara*—
not having a lord, the former having a lord. It mostly treats of moksha (salvation) and metempsychosis. It contained not only theory, but also tales (i. 93). Haggadic elements by way of illustration.

Alberuni’s Patañjali is totally different from “The Yoga Aphorisms of Patañjali” (with the commentary of Bhoja Rājā, and an English translation by Rajendralal Mitra, Calcutta, 1883), and, as far as I may judge, the philosophic system of the former differs in many points essentially from that of the Sūtras.

Moreover, the extracts given in the Indica stand in no relation with the commentary of Bhoja Rājā, although the commentator here and there mentions ideas which in a like or similar form occur in Alberuni’s work, both works being intended to explain the principles of the same school of philosophy.

Besides the text of Patañjali, a commentary also is mentioned and quoted (i. 232, 234, 236, 238, 248). It is most remarkable that the extracts from this commentary are all of them not of a philosophic, but of a plainly Paurānic character, treating of cosmographic subjects, the lokas, Mount Meru, the different spheres, &c. The name of the commentator is not mentioned. If the quotations on i. 273 seq. may be considered as derived from this commentary, the author was Balabhadra. V. index i. s.v. Patañjali.

P. 29. Gītā.—The book Gītā is, according to Alberuni, a part of the book Bhārata (i.e. Mahābhārata, which term does not occur in the Indica 1), and a conversation between Vāsudeva and Arjuna (Ｖासुदेव और अर्जुन). It is largely quoted in chapters relating to religion and philosophy. We have now to examine in what relation Alberuni’s Gītā stands to the well-known Bhagavad-Gītā as we have it in our time. Cf. “Hindu Philosophy,” “The Bhagavad-Gītā, or the Sacred Lay,” translated by J. Davies, London, 1882. The latter is described as a skilful union of the systems of Kapila and Patañjali with a large admixture of the prevailing Brāhmaṇic doctrines. Although the opinions regarding its origin differ widely, it can scarcely be denied that it is not free from having been influenced to a certain degree by

1 Cf. Alberuni on the Mahābhārata, i. 132, 133.
Christianity, and that it could not have been composed before the third Christian century. Chapter xi. gives the impression of having been modelled after a Christian apocryphal.

The quotations from the Gītā (or Song) may be divided into three classes:

1. Such as exhibit a close relationship with certain passages in the Bhagavad-Gītā. Parts of sentences are here and there almost identical, but nowhere whole sentences; v. i. 40, 52, 73, 74, 86, 87, 103, 104, 218 (v. note), 352; ii. 169.

2. Such as show a certain similarity, more in the ideas expressed than in the wording, with passages in the Bhagavad-Gītā; v. i. 29, 70, 71, 78, 79, 103, 104, 122.

3. Such as cannot be compared, either in idea or in wording, with any passage in the Bhagavad-Gītā; v. i. 52, 53, 54, 70, 71, 73, 74, 75, 76, 78, 79, 80, 92, 122; ii. 137, 138.

The single texts will be discussed in the notes to the places in question.

The quotations given by Alberuni cannot have been translated from the Bhagavad-Gītā in its present form. Admitting even that the translator translated as little literally and accurately as possible (and the texts of Alberuni do not give this impression), there remains a great number of passages which on no account could be derived from the present Sanskrit text, simply because they do not exist there. Or has Alberuni translated a commentary of the Bhagavad-Gītā instead of the original? The text of the extracts, as given in the Indica, is remarkably short and precise, extremely well worded, without any repetition and verbosity, and these are qualities of style which hardly point to a commentary.

Alberuni seems to have used an edition of the Bhagavad-Gītā totally different from the one which we know, and which also in India seems to be the only one known. It must have been more ancient, because the notorious Yoga elements are not found in it, and these have been recognised by the modern interpreters as interpolations of a later time. Secondly, it must have been more complete, because it exhibits a number of sentences which are not found in the Bhagavad-Gītā.
Various generations of Hindu scholars have modelled and remodelled this book, one of the most precious gems of their literature, and it seems astonishing that an edition of it which existed as late as the time of Alberuni should not have reached the nineteenth century.

As regards the quotation on this page (29), it exhibits only in the substance a distant relationship with Bhagavad-Gîtâ, x. 3: “He who knows Me as unborn and without beginning, the mighty Lord of the world, he of mortals is free from delusion, he is free from all sin.”

P. 30. Sāṅkhya.—The book Sāṅkhya, as used and translated by Alberuni, had the form of a conversation between an anchorite and a sage, and it contained a treatise on the origines and a description of all created beings (i. 8), a book on divine subjects (i. 132). It was composed by Kapila. The author quotes it largely on questions of religion and philosophy. The Sāṅkhya philosophy of Kapila is the most ancient system of thought among the Hindus, the source of the Yoga doctrine of Patañjali. Cf. Colebrooke, “Essays,” i. 239–279; J. Davies, “Hindu Philosophy,” &c., p. 101 seq.

The relation between Alberuni’s Sāṅkhya and the so-called Sāṅkhyaapravacanam (“The Sāṅkhya Aphorisms of Kapila,” translated by Ballantyne, London, 1835) is a very distant one, and is limited to this, that there occurs a small number of passages which show a similarity of matter, not of form. The latter book (the Sūtras) seems to be a late secondary production; v. A. Weber, Vorlesungen über Indische Literaturgeschichte, p. 254, note 250. Besides, the philosophic system propounded by Alberuni under the name of Sāṅkhya seems in various and essential points to differ from that of the Sūtras; it seems altogether to have had a totally different tendency. The Sūtras treat of the complete cessation of pain; the first one runs thus: “Well, the complete cessation of pain, (which is) of three kinds, is the complete end of man;” whilst the Sāṅkhya of Alberuni teaches moksha by means of knowledge.

Next we have to compare Alberuni’s Sāṅkhya with the Sāṅkhya Kārikā of Īśvara Krishna (v. Colebrooke, “Essays,” i. 272; J. Davies, “Hindu Philosophy,” London,
Both works teach moksha by means of knowledge, and contain here and there the same subject-matter. It must be observed that of those illustrative tales which Alberuni's Sāṁkhya gives in full length, short indications are found in the Sāṁkhya Kārikā. Its author, Īśvara Krishna, says at the end of his book that he has written his seventy Śātras, excluding illustrative tales. This is not quite correct, as sometimes, though he has not told them, he has at all events indicated them. His words show that he has copied from a book like the Sāṁkhya of Alberuni, in which the tales were not only indicated, but related at full length. Cf. A. Weber, Vorlesungen über Indische Literaturgeschichte, Berlin, 1876, p. 254, note 250. Hall considers the S. Pravacanam to be younger than the S. Kārikā.

If, in the third place, we examine the Bhāshya of Gauḍapāda, we find that it is not identical with Alberuni's Sāṁkhya, but a near relative of it. Cf. the Sāṁkhya Kārikā, &c., translated by Colebrooke, also the Bhāshya of Gauḍapāda, translated by H. H. Wilson, Oxford, 1837; Colebrooke, "Essays," i. 245. Most of the quotations given by Alberuni are found only slightly differing in Gauḍapāda, and some agree literally, as I shall point out in the notes to the single passages. Almost all the illustrative tales mentioned by Alberuni are found in Gauḍapāda, being, as a rule, more extensive in Alberuni than in Gauḍapāda. The latter seems to have taken his information from a work near akin to, or identical with, that Sāṁkhya book which was used by Alberuni.

According to Colebrooke (in the preface of the work just mentioned, on p. xiii.), Gauḍapāda was the teacher of Śaṅkara Ācārya, who is said to have lived in the eighth Christian century. Cf. also A. Weber, Vorlesungen, pp. 179, 254, and 260: Alberuni does not mention Gauḍapāda, as far as I can see. Or is he perhaps identical with Gauḍa the anchorite, whom Alberuni mentions even before Kapila? Cf. the passage, i. 131–132: "Besides, the Hindus have books, &c., on the process of becoming God and seeking liberation from the world, as, e.g. the book composed by Gauḍa the anchorite, which goes by his name."

Kapila, the father of the Sāṁkhya philosophy, is mentioned by Alberuni also as the author of a book called
Nyāyabhāṣā, "on the Veda and its interpretation, also showing that it has been created, and distinguishing within the Veda between such injunctions as are obligatory only in certain cases and those which are obligatory in general" (i. 132). The subject of this book is evidently not related to the Nyāya philosophy, but to the tenets of the Mīmāṃsā philosophy, i.e. the Pūrva-mīmāṃsā, (Colebrooke, "Essays," i. p. 319–349; J. Davies, "Hindu Philosophy," p. 2; Thibaut, Arthasaṣṭra, Benares, 1882), a system of rules which are applied to the text of the Veda and its sacrificial prescriptions.

P. 31. The anthropomorphic doctrines, the teachings of the Jabriyya sect, &c.—The sect called Jabriyya, Jabariyya, and Mujbara teaches that the actions of man proceed from God. They are the followers of Al-najjār. Cf. Fihrist, p. 179 seq.


I understand the passage (११, १२) as meaning the prohibition of the study (not discussion, as I have translated, which would be the ṭanāšt) of a subject, i.e. a question of a religious bearing; but I am not aware what particular event the author hints at by these words. At the intolerant religious policy of the Khalif Alkâdir? King Maḥmūd was a great Ketzerrichter. Probably a stout adherent of the theory of the harmony of throne and altar, which his contemporaries Al-Utbī (in his preface) and Alberuni (i. 99) call twins, he tried to cover the illegitimate, revolutionary origin of his dynasty, which was still fresh in the memory of the men of the time; he maintained the most loyal relations with the spiritual head of Islam, the Khalif of Bagdad, Alkâdir (a.h. 381–422), who had clad the usurpation of his family with the mantle of legitimacy; and in order to please him, he hunted down the heretics in his realm in Khurasan as in Multān (cf. Reynolds, l. l., p. 438 seq.), impaling or stoning them. He tried to rid
the Khalif of the real or suspected votaries of his opponent, the Anti-Khalif in Egypt, the famous Ḥākim, famous by his madness and by being considered by the Druzes as the originator of their creed. The religious policy of Mahmūd may be retraced to the following principles:

1. Perfect toleration for the Hindus at his court and in his army.

2. Persecution of certain Muslim sectarians in the interest of the Khalif, of the Karmatians and other sects of Shiitic tendencies. (Cf. A. von Kremer, Geschichte der herschenden Ideen des Islam, Leipzig, 1868, p. 127.)

3. Predilection for a Muslim sectarian from Sijistān by the name of Abū-'Abdillāh Ibn Alkirām, by whose influence both Sunnites and Shiites had to suffer (cf. Alshahrastānī, p. vi). How long the influence of this man had lasted, and how far his doctrines had been carried into practice, does not appear from Alshahrastānī’s account.

That, notwithstanding all this, there was a large margin for liberty of religious thought under the rule of Mahmūd and his immediate successor, is sufficiently illustrated by the tenor of Alberuni’s work. Altogether, it must be kept in mind that before Alghāzālī the Muslim Church was not that concentrated organisation nor that all-overwhelming force which it has been ever since and keeps up in our days. To those who only know the centuries of Muslim history after the establishment of the orthodox Church, it sounds next to incredible that the military chief of a Khalif should have been an infidel (a Zoroastrian?)

Cf. the story of Afshin, the general of the Khalif Almu’taṣim, in Menoutchetri, Poëte Persan, par A. de Biberstein. Kazimirski, p. 149.

P. 33. τὸ λαυθάνεων.—The word *kumān*, which I have thus rendered, means to be hidden. Not knowing to what school of Greek philosophers the author refers, I can only give the note of Reiske, "اهل الكلامون, Philosophi qui omnes animas simul et semel creatas et reconditas in Adamo putant" (Freytag, Lexicon Arabicum, s.h.v.).

P. 33. *Pailāsopā*, &c.—As Syrian scholars were the author’s teachers in Greek philosophy, he knows the Greek word *φιλόσοφος* only in its Syrian garb ܫܠܝܚܐ. 
The *Ahl-aqṣuffa* were certain persons, poor refugees and houseless men, who during the first years of Muhammad's stay in Medina passed the night in the *suffa* of the mosque of the Prophet in Medina, which was a covered place, an appurtenance of the mosque, roofed over with palm-sticks (Lane).

*Abulfath Al-Bustî* was a famous poet of the time. A native of Bust in Northern Afghanistan, he was in the service of the governor, who held the place under the Sâmâni dynasty, and after the conquest of Bust by Sabuktigin he entered the service of this prince and of his son Maḥmûd. Under Maṣâd he lived still in Ghazna, for Baihaki mentions that he had fallen into disgrace and had to carry water for the royal stables. By the intervention of Baihaki, he was restored into the good graces of the prime minister, Ahmad Ibn Hasan of Maimand. *Cf.* Elliot, "History of India, ii. 82, 84, iv. 161; Ethé, *Rudagi's Vorläufer und Zeitgenossen*, p. 55. According to Ḥâji Khalifa (iii. 257, iv. 533), he died AH 430 (A.D. 1039). For further information see Shahrazûri, *Nuzhat-al'arwâb*, fol. 182b (MS. of the Royal Library, Berlin, MSS. Orient. octav. 217); Al-Baihaki, *Tatimmât-ługdûn-ul-hikma*, fol. 22b (MS. of the same library, Petermann, ii. 737); also Mirchondi *Historia Gasnevidarum Persice*, by F. Wilken, Berlin, 1832, p. 144. Towards the end of his life he is said to have travelled with an embassy of the Khâkân of Transoxiana to that country, and to have died there.

P. 34. Galenus.—The author quotes the following works of Galenus:—

(1.) λόγος προτερπτικός.

(2.) A commentary to the aphorisms of Hippokrates, a book of which I do not know the Greek original (*cf.* i. 35, ii. 168).

(3.) *Kitâb al-mi'amâr* (from the Syriac میامیر) = *περὶ συνθέσεως φαρμάκων τῶν κατὰ τόπους*.

(4.) *Kitâb al-harak* = *the book of the proof*, of which I do not know the Greek original; *cf.* i. 97.

(5.) اخلاق النفس = *de indole animæ* (*περὶ ἕθων*?), of which the Greek original likewise is not known to me; *cf.* i. 123, 124.

(6.) *Kitâb Qalam-i-hâsî* = *περὶ συνθέσεως φαρμάκων κατὰ γένη*. 
Besides, the author gives some quotations from Galen without mentioning from what particular book they were taken; cf. i. 222, 320. Cf. on Galen’s works in Arabic Dr. Klamroth, “Journal of the German Oriental Society,” vol. xl. 189 seq.


The two passages on p. 36 are probably taken from the Protrepticus too. With the former compare the words in chap. ix. (on p. 22 editio Kühn, vol. i.): Εἰ δ’ οὐκ ἐθέλεις ἐμοὶ πειθῆσαι, τὸν γε θεόν αἰδέσθητι τὸν Πύθιον.

Shortly afterwards follows the second quotation, verses quoted by Galen from Herodotus, i. 65:

"Ἡκεῖς, ὅ Λυκόεργε, ἐμὸν ποτὶ πίωνα νηών.
Δίκω ἡ σε θεῶν μαντεύσομαι ἡ ἀνθρωπον,
ἄλλ’ εἴτι: ἄ μᾶλλον θεῶν ἐλπόμαι, ὅ Λυκόεργε.

P. 35. Plato.—The author quotes the following works of Plato:—

(1.) Phædo.
(2.) Timæus (cf. also Proclus).
(3.) Leges.

Of the three quotations on this passage, the middle one is found in Timæus, 41A:—'Επει δ’ οὖν πάντες κ. τ. λ., λέγει πρὸς αὐτούς ὅ τόῳ τὸ πάν γεννήσας τάδε· θεῶν θεῶν κ. τ. λ., ἄλλωναί μεν οὖν ἄστε ὁδῷ ἀληθοί τὸ πάμπαν· οὔτε μὲν ὃς λυθήσεσθε γε οὐδὲ τεύξεσθε θανάτου μοίρας, τῆς ἐμῆς βουλήσεως μείζονος ἐπὶ δεσμοῦ καὶ κυριωτέρου λαχανέων ἐκείνων οὐ ὁτ’ ἐγγίνεσθε ξυνεδείσθε.

The first and third quotations are not found in the Greek text, and Ed. Zeller, to whom I applied for help, thinks that both are taken from a commentary on Timæus by some Christian author, as e.g. Johannes Philoponus, the former having been derived from 40D (περὶ δὲ τῶν ἄλλων
The index of the works of Johannes Philoponus or Scholasticus (Steinschneider, *Al-Fārābī*, p. 152 seq.) does not mention a commentary on *Timæus*, if it is not concealed under the title of one of his books, i.e. on existing and perishing. As he was a literary opponent of Nestorius, he seems to have been a strict Monophysite, which would be in keeping with the third quotation, "God is in the single number," &c. Cf. the note to pp. 56, 57.

P. 36. *Johannes Grammaticus* (identical with J. Philoponus and Scholasticus) is five times quoted. There are three extracts from his *Refutatio Procli*, and two more, the origin of which is not mentioned, but probably taken from the same book. The passage here mentioned is found in *Joannis Grammatici Philoponi Alexandrini contra Proclum de Mundi extermitate*, libri xiii., Venetiis, 1551, Greek and Latin, in the 18th λόγος, chap. ix. (there is no pagination; cf. the Latin translation, p. 95):

"μὴ δὲ γὰρ εἰδέναι τῶν ἐκείνων ἄλλο τι θεῶν πλῆθυ τῶν φαινομένων σωμάτων ἡλίου καὶ σελήνης καὶ τῶν λυπῶν, ὡσπερ καὶ μέχρι νῦν τῶν βαρβάρων ὑπολομβάνειν τοὺς πλείστους. ὡσπερον δὲ φησιν εἰς ἐματίαν καὶ τῶν ἄλλων θεῶν τῶν ἄσωμάτων ἐλληνες ἐλθόντας, τῷ αὐτῷ κάκεινος προσαγορεῦσαι ὀνόματι.

I have not succeeded in identifying the other four quotations, i. 65, 226, 231, 284. Cf. on this author, *Finrist*, p. 254, and Dr. Steinschneider, *Alfārābī*, pp. 152, 162.

P. 37. *Baal*.—The form of the word באל (Syriac בֵּאל) shows that the Arabic Bible-text which Alberuni used had been translated from Syriac.


P. 40. *Gītā*.—Cf. with these words the *Bhagavad-Gītā* (of J. Davies), xv. 14, 15:

"Entering into the earth, I sustain all things by my vital force, and becoming a savoury juice, I nourish all herbs (v. 14).

"I become fire, and enter into the bodies of all that breathe, &c. And I am seated in the hearts of all: from
Me come memory, knowledge, and the power of reason,"
&c. (v. 15).

Davies supposes the whole of verse 15 to be an interpo-
lation, but this remark must, as it seems, be limited to the
final sentence of verse 15 only, i.e. to the words: "I form
the Vedânta, and I am one who knows the Vedas."

P. 40. Apollonius.—A Greek book of Apollonius of
Tyana of this title is not known to me, but it exists in
Arabic, (Liber de Causis), in the library of
Leyden, cf. Wenrich, De Auctorum Graecorum Versionibus
et Commentariis Syriacis, Arabicis, &c., p. 239.

Pp. 40-44.—The Sâmkhya doctrine of the twenty-five
tattvas is found in the commentary of Gaudapâda to the
Sâmkhya Kârikâ of Īsvara Krishna, where also the saying
of Vyâsa (here i. 44 and 104) is found. Cf. the translation
of H. H. Wilson, p. 79, i. 14.

P. 40. Buddha, dharma, saṅgha.—This note on the
Buddhistic trinity probably rests on the authority of
Zurkân, as he was quoted in the book of Erdnshahri; cf.
note to pp. 6, 7. It shows that Alberuni had no original
information regarding Buddhism, and it justifies his harsh
judgment on the worth of the tradition of Zurkân, v. i. 7.

The name Buddhodana is nothing, and by mistake
derived from Šuddhodana, the name of Buddha's father.
Perhaps Zurkân had read not پردههربن بدهدین, which
would be Šauddhodani, i.e. the son of Šuddhodana or
Buddha.

P. 41. Vâyu Purâna.—Of the Purânas the author had
the Āditya, Matsya, and Vâyu Purânas, i.e. only portions
of them (i. 130), and probably the whole of Vishnu-
Purâna. Most of his Pauranic quotations are taken from
Vâyu, Vishnu, and Matsya Purânas. Cf. on the Purânas,

P. 42.—The five mothers are a blunder of the author's
instead of the five measures, i.e. pañcamâtrâni (pañcatan-
mâtrâni).

The combination between the senses and the elements,
as it is given here and on p. 43, also occurs in the Vais-
vol. ii.
Philosophy of Kanâda: cf. Colebrooke, "Essays," i. 293 seq. Compare also Vishnu-Purâna, i. 2, p. 35, and Hall's note i. There are similar elements in the philosophy of the Baudhâyas or Saugatas: v. Colebrooke, l.c. i. 416, 417.

P. 42.—The quotation from Homer is not found in the Greek text, nor do I know the Greek original of the second verse. Were they taken from some Neo-Pythagorean book?

P. 43. Porphyry.—This is the only quotation from Porphyry, from a book of his which is not extant in the Greek original. According to Wenrich, l.c. p. 287, there has once been in Syriac a translation of the fourth book of a Liber Historiarum Philosophorum, probably identical with the work here mentioned. The note on the Milky Way (i. 281) is perhaps taken from this same source.

P. 43. Lacuna.—In the Arabic text (1, 15) is missing the relation between the hearing and the air; the complement to the words hearing airy in l. 14.

P. 43. Plato.—As the author does not mention the source whence he took these words, I conjecture that they were derived from Timaeus, 77, A, B, or from some commentary on this passage: cf. note to p. 35.

P. 45. Matres simplices.—Cf. note to p. 42. On the Sâmkhya theory regarding the union of soul and matter, cf. Sâmkhya Kârikâ, vv. 20, 21, 42, and Gauḍapâda's Bhâshya.

P. 47. Dancing-girl.—This example is likewise found in Gauḍapâda, p. 170 (Bhâshya to v. 59 of the Saṁkhyâ Kârikâ); that of the blind and the lame on p. 76 (to v. 21).

P. 48. Mânt.—Vide note to pp. 7, 8.

P. 48. The book of Saṁkhyâ, &c.—The theory of predominance among the three primary forces (guna), v. in Gauḍapâda, pp. 92, 93, to v. 25, p. 49 to v. 12; the com-
parison of the soul with a spectator on p. 72 to v. 19 (also Bhagavad-Gītā, xiv. 23); the story of the innocent among the robbers on p. 74 to v. 20.

P. 49. The soul is in matter, &c.—The soul compared to a charioteer, v. in Gauḍapāda, p. 66 to v. 17.

Pp. 52–54. Vāsudeva speaks to Arjuna, &c.—Of these quotations from Gītā, compare the passage, "Eternity is common to both of us, &c., whilst they were concealed from you," with Bhagavad-Gītā, iv. 5: "Many have been in past time the births of me, and of thee also, Arjuna. All these I know, but thou knowest them not, O slayer of foes!"

Of the other quotations on these two pages, I do not see how they could be compared with any passage in Bhagavad-Gītā, except for the general tenor of the ideas. With the phrase, "For he loves God and God loves him," cf. Bhagavad-Gītā, xii. 14–20, "Who worships me is dear to me."

P. 54. Vishṇu-Dharma.—Alberuni gives large quotations from this book. He speaks of it i. 132, and translates the title as the religion of God.

I do not know the Sanskrit original of the book, for it is totally different from the Vishṇu-Smṛti, or Vishṇu-Sūtra, or Vaishnava Dharmasāstra, translated by J. Jolly ("The Institutes of Vishṇu," Oxford, 1880), a law-book in a hundred chapters, similar to those of Āpastamba, Yājnavalkya, Vasishṭha, the Grihyasūtras, &c. Our Vishṇu-Dharma is a sort of Purāṇa, full of those legends and notions characteristic of the literature of Purāṇas; but the author does not assign it to them. Most of the extracts here given are conversations between the sage Mārkaṇḍeya and Vaiśravaṇa, others a conversation between the king Parīkṣa and the sage Saṭānīka. The extracts treat of mythological subjects (i. 54); the twelve suns (i. 216, 217); the pole (i. 241); the planets and fixed stars (i. 287, 288); star-legends (i. 291); the story of Hīranyakṣipu (ii. 140); the names of the Manvantaras (i. 387); the dominants of the planets (ii. 121); in particular, of chronological and astronomical subjects. The author has taken several series of names from the Vishṇu-Dharma. He
seems to quote it sometimes without mentioning its title. So, e.g. I am inclined to attribute the traditions of Saunaka (i. 113, 126) to this book. The quotation (ii. 398) on Vāsudeva, Samkarāhara, Pradyumna, and Aniruddha, as the names of Hari in the four Yugas, is found likewise among the doctrines of the Vaishnava sect, the Pāñcarāstras, or Bhāgavatās: cf. Colebrooke, "Essays," i. 439, 440. Viṣṇu is the chief god of those Hindus with whom Alberuni held relation. Were they Vaishnava sects, and was the Viṣṇu-Dharma a special code of theirs? On the heterodox sect of Viṣṇu or Vāsudeva worshippers just mentioned, cf. Colebrooke, l.c. pp. 437-443.

Colebrooke mentions a book, Viṣṇu-Dharmottara-Purāṇa, which is said to have comprehended the Brahmāsiddhānta of Brahmagupta: cf. "Essays," ii. 348. This work is perhaps identical with the Viṣṇu-Dharma used by Alberuni. As he had a copy of the Brahmāsiddhānta, he had it perhaps as a portion of this larger work.

P. 54. Lākṣmī, who produced the Amṛita.—For the legend of Lākṣmī v. Viṣṇu-Purāṇa, i. 9, where it is Dhanvantari who brings the Amṛta-cup, not Lākṣmī. Apparently this goddess is meant here, and not Lākṣmaṇa, as the manuscript has it, the brother of Rāma. When Alberuni wrote this, he seems to have mistaken Lākṣmī for a masculine being, or else we must write लक्ष्मी in the text tv, 3, instead of लक्ष्मी.

The Arabic had'a (=aisance, félicité) is an attempt of Alberuni's to translate the Sanskrit amṛta=ambrosia, which scarcely any one of his readers will have understood. Cf. the Arabic text, "म, 6 (here i. 253).

P. 54. Dākṣa, who was beaten by Mahādeva.—Cf. the story of the destruction of Dākṣa's sacrifice by order of Siva, as communicated by Hall in his edition of Wilson's Viṣṇu-Purāṇa as appendix to i. viii. p. 120 seq. (Sacrifice of Dākṣa, from the Vāyu-Purāṇa).

P. 54. Varāhamihira.—Of this author Alberuni quotes the following works:—

(1.) Brihatasamhitā.
(2.) Brihadjīta, i. 158, 219, 220, ii. 118.
(3.) Laghujdatakam, i. 158.
(4.) Pancasiddhantika, i. 153, ii. 7, 190.

Books of the same author, which Alberuni mentions without giving extracts from them, are Shatpañcābikā and Ḥamrī (?), both with astrological contents (i. 158). Perhaps the two books called Yogaydrā and Tikani (?)-yātra (i. 158) are also to be attributed to Varāhamihira. Besides there are mentioned several commentaries, one of the Brīhat-Samhitā by Utpala, from Kashmir (i. 298), and one of the Brīhajjātakam by Balabhādra.

One of the sources whence Alberuni has drawn most copiously is the Brīhat-Samhitā, or, as he calls it, the Samhitā: v. the edition of the Sanskrit original by Dr. Kern, Calcutta, 1865, and his translation in the "Journal of the Royal Asiatic Society" for the years 1870, 1871, 1873, 1875. Alberuni praises Varāhamihira as an honest man of science (i. 366), and maintains that he lived 526 years before his own time, which is A.D. 1030. Accordingly, the date of Varāhamihira would be A.D. 504. Cf. ii. 86.

In the preface to the edition, p. 61, Kern mentions the Shatpañcābikā and the Yogaydrā. Both the Brīhat-Samhitā and Laghujdatakam had been translated into Arabic by Alberuni.

The passage here (p. 54) quoted is found in chap. iii. v. 13–15 ("Journal of the Royal Asiatic Society," 1870, p. 446).

P. 54. Māṇī.—Vide note to pp. 7, 8.

P. 55. Patañjali.—Vide note to p. 27.

Pp. 56, 57. Phaedo.—The two quotations from Phaedo are the following:

70C. τολαῖοι μὲν οὖν ἐστὶ λόγος, οὗ μεμνήμεθα, ὡς εἰσὶν ἐνθέντε ἀφικόμεναι ἐκεῖ, καὶ πάλιν ἑν δεύρῳ ἀφικούμεθα καὶ γίγνονται ἐκ τῶν τεθεωτῶν, καὶ εἰ τοῦθ' οὕτως ἔχει, πάλιν γίγνεσθαι ἐκ τῶν ἀποθανόντων τοῖς ζωταῖς, ἀλλ' τε ἡ ἐλευθερία ἀν αἱ φύσεις ἡμῶν ἐκεῖ, κ.τ.λ.

ἀρ' οὕτως γίγνεται πάντα, οὐκ ἀλλοθεν ἢ ἐκ τῶν ἐναντίων τὰ ἐναντία, κ.τ.λ.

The sentences which in the Arabic follow after these
words ("Our souls lead an existence of their own," &c.) cannot be combined with the Greek text, and I suppose they were taken from some commentary.

The second quotation is found

72E. ὅτι ἡμῶν ἡ µάθησις οὐκ ἄλλο τι ἡ ἀνάµνησις τύχανεν οὕσα, καὶ κατὰ τούτοις ἰδέα την ἡμᾶς ἐν προτέρῳ τινὶ χρόνῳ μεμαθηκέναι ἐν νῦν ἀνάµμνησκόµβα. τούτῳ δὲ ἀδύνατον, εἰ μὴ ἦν που ἡµῶν ἡ ψυχὴ, πρὶν ἐν τῷ τῶν ἀνθρωπίνω ἐντοίχον ἐνησί." κ.τ.λ.

73D. οὐκοῦν ὕσιτα ὅτι οἱ ἐρασταὶ, ὅταν ἔδωκαν λύραν ἡ ἰμάτιον ἡ ἄλλο τι, ὡς τὰ παιδικὰ αὐτῶν ἐκεῖθεν χρησθαί, πάσχονσι τούτῳ. ἐγνωσάν τε τὴν λύραν καὶ ἐν τῇ διανολῇ ἔλαβον τὸ εἴδος τοῦ παιδός, οὔ ἦν ἡ λύρα; τούτῳ δὲ ἐστὶν ἀνάµνησις.

In some sentences the Arabic and Greek texts agree literally; in others they differ to such an extent that this extract, too, does not seem to be taken from a simple translation of the text of Phædo, but rather from a work in which text and commentary were mixed together, and the original form of a dialogue was changed into that of a simple relation. Alberuni erroneously held this to be the original form of the book. We have arrived at a similar result in the case of Plato's Timæus.

Proclus has composed a commentary on the saying of Plato that the soul is immortal, in three sections: v. Wenrich, De Autorum Graecorum Versionibus, &c., p. 288; and Zeller, Philosophie der Griechen, iii. 6, 780, 1. This was probably an Arabic edition of Phædo, and possibly that one which Alberuni used. Cf. note to p. 35.

The quotations from Phædo given farther on (pp. 65–67) agree more accurately with the Greek original, but in them, too, the dialogistic form has disappeared.

P. 57. Proclus is twice quoted, here and i. 86. Both extracts seem to be derived from some commentary on Timæus, which was different from that commentary known in our time and edited by Schneider, Breslau, 1887. The words here mentioned probably refer to Timæus, 44 A B C: — καὶ διὰ δὴ ταῦτα πάντα τὰ παθήματα νῦν κατὰ ἄρχας τε ἀνους ψυχῆ γνώρεται τὸ πρῶτον, ὅταν εἰς σώμα ἐνδεχὴ θνητοῦ κ.τ.λ. χωλὴν τοῦ βλου διαπορευθές ζωῆ, ἀτελῆς καὶ ἀνόητος εἰς "Αἰδού πάλαι ἔρχεται."
The commentary of Proclus referring to these words (pp. 842, 843, ed. Schneider) is entirely different from the Arabic words.

The other quotation (i. 86) is derived from the same book, and refers to Timaeus, 44D:—εἰς σφαιροειδὲς σώμα ἔνθησαν, τούτῳ δὲ νῦν κεφαλὴν ἐπονομάζομεν, δ θεωτατον τ' ἐστὶ καὶ τῶν ἐν ἡμῖν πάνων δεσποτῶν, κ.τ.λ.

The commentary of Proclus (ed. Schneider) breaks off a little before this passage, at the beginning of 44D.

I am inclined to believe that the work, simply introduced by "Proclus says," is identical with that one which he calls Timaeus (cf. note to page 35), a work which was—

(1.) Not a simple translation of the book, but a translation and a commentary together, the one running into the other; and which

(2.) Was different from the now extant commentary of Timaeus by Proclus. Therefore Proclus must either have made two editions of Timaeus, or he is not really the author of the book used by Alberuni. In the one place the name is written ابرونليس, in the other 

P. 57.—The seat (الكرسي) and the throne (العر) of God. By these two words Muhammad calls the throne of God in the Koran. Allah’s sitting on his throne, as mentioned in the Koran, has been a subject of deep speculation among Muslim theologians. Cf. Zur Geschichte Abulhasan Al-Ashari’s, von W. Spitta, Leipzig, 1876, pp. 106, 107, and the note on p. 144.

P. 60. Vishnu-Purāna.—The passage is found in Book II. chap. vi. (Wilson-Hall, ii. p. 216). The order in which the hells are enumerated and their names differ to some extent:—

<table>
<thead>
<tr>
<th>Arabic</th>
<th>Sanskrit original</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberuni</td>
<td>Raurava,</td>
</tr>
<tr>
<td>Rodha</td>
<td>Rodha,</td>
</tr>
<tr>
<td>Taptakumbha</td>
<td>Sūkara,</td>
</tr>
<tr>
<td>Mahājavāla,</td>
<td>Tāla,</td>
</tr>
<tr>
<td>5. Savala</td>
<td>5. Taptakumbha,</td>
</tr>
<tr>
<td>Krimśa</td>
<td>Taptaloha,</td>
</tr>
<tr>
<td>Lālabhakasha,</td>
<td>Mahājavāla,</td>
</tr>
<tr>
<td>Viśasana</td>
<td>Lavana,</td>
</tr>
<tr>
<td>Adhomukha</td>
<td>Vimohā,</td>
</tr>
<tr>
<td>10. Rudhirāndha</td>
<td>10. Krimśhaksha,</td>
</tr>
</tbody>
</table>

P. 63. *Ātivāhika.*—On the *ātivāhika*—that which is swifter than the wind in passing from body to body, cf. *Sāṁkhya Kārikā,* ed. Colebrooke-Wilson, p. 133.

The *Barzakh* is mentioned in the Koran, 23, 102; 25, 55; 55, 20.

P. 63. *Vishnu-Purāṇa.*—This quotation is related in substance to Book II. chap. vi. pp. 221–224: cf. the uninterrupted thinking (sānismarana) with the remembrance of Hari, the meditation on Vāsudeva. Are the words of Alberuni an extract from this passage?

P. 64. *Sāṁkhya.*—The *S. Kārikā* and Gaudapāda do not seem to offer anything analogous to this passage.

P. 64.—*A. theosoph,* &c.—The passage relating to the four degrees of metempsychosis has been translated into Persian by Abulma‘āli Muḥammad Ibr ‘Uṣayd-Allāh in his *Bayān al‘adyn* : v. C. Schefler, *Chrestomathie Persane,* i. v. l. 3–8.

Abū-Ya’kūb and his work are not known to me from other sources.

P. 65. *Johannes Grammaticus.*—*Vide* note to p. 36.

*Phaedo.*—The quotations on pp. 65–67 agree pretty accurately with the Greek text.
The body is earthy, &c., 81 C. D.—

Ἐμβριθῆς δὲ γε, ὁ φιλε, τοῦτο ὕεσθαι χρὴ εἶναι καὶ βαρὺ καὶ γεώδες καὶ ὅρατὸν ὁ δὴ καὶ ἔχουσα ἡ τοιαῦτη ψυχὴ βαρύνεται τε καὶ ἐλκεται πάλιν εἰς τὸν ὕμωτον τὸπον φῶβο του ἀειδοῦς τε καὶ "Διόν, ὥσπερ λέγεται, περὶ τὰ μνήματα τε καὶ τῶς τάφως κυλινδομένη, περὶ ὃ δὴ καὶ ὥθη ᾧτα ψυχῶν σκιειδῆ φαντάσματα, οἷα παρέχονται αἰ τοιαῦτα ψυχαὶ εἰδωλα αἱ μὴ καθαρῶς ἀπολυθεῖσαι, ἀλλὰ καὶ τοῦ ὅρατος μετέχουσαι, διό καὶ ὀρῶνται.

It appears that these are not the souls, &c., 81 D—82 A:—

Εἰκὸς μὲν οὖ ν τὰς τῶν ἁγαθῶν ταῦτας εἶναι, ἄλλα τὰς τῶν φαύλων, αἱ περὶ τὰ τοιαῦτα ἀναγκαίως πλανᾶσθαι δίκην τίνους τὰς προτέρας τροφῆς κακῆς ὀφθης καὶ μέχρι γε τοῦτον πλανῶνται, ἔσω ἂν τὴ ἕνεπακολοουθοῦσος τοῦ σωματοειδοῦς ἐπιθυμία πάλιν ἐνδεχόμεθα εἰς σώμα.

Ἐνδοῦνται δὲ, ὥσπερ εἰκὸς, εἰς τοιαῦτα ἕδθη ὅποι ἂττ' ἂν καὶ μεμελητηκώι τύχωσιν ἐν τῷ βίῳ. Τὰ τοῖα δὴ ταῦτα λέγεις, ὁ Σ.κρατεῖς; Ὁδυν τοὺς μὲν γαστρομαργίας τε καὶ ὑβρεῖς καὶ φιλοποσίας μεμελητηκότας καὶ μὴ διενιθημένους εἰς τὰ τῶν ὄνων γένη καὶ τῶν τοιούτων θηρίων εἰκὸς ἐνδεχόμεθαι· ἢ οὐκ οἶει; πάνω μὲν ὅν εἰκὸς λέγεις. Τοὺς δὲ γε ἄδικας τε καὶ πυρανιδα καὶ ἄρσαγας προτετειμηκότας εἰς τὰ τῶν λύκων τε καὶ ιεράκων καὶ ἱκτίων γένη.

If I did not think that I am going, &c., 63 B:—

εἰ μὲν μὴ φιμιν ἤπειρον πρότον μὲν παρὰ θεοὺς ἄλλους σοφοὺς τε καὶ ἁγαθούς, ἐπείτα καὶ παρ' ἀνθρώπους τετελευτηκότας ἀμείνους τῶν ἐνθάδε, ἱδίκουν ἃν οὐκ ἁγανακτῶν τῷ θανάτῳ.

P. 66. When a man dies, a daimon, &c., 107 D, 108 C:—

λέγεται δὲ οὕτως, ὅσ' ἄρα τελευτήσαντα ἕκαστον ὁ ἕκαστον δαιμόν, ὅσπερ ζωντα εἰληχεί, οὕτως ἠγέων ἐπίχειρει εἰς ὃ δὴ τινα τόπον, οὐ δὲ τοὺς συλλεγέντας διάδικαςαμένους εἰς "Διόν προεξεῖσθαι μετά ἥγεμόνος εκείνου, ὃ δὴ προστέ-
τακται τους ἐνδέχεται εκείνη τορέονται. τυχόντας δ' εἴκε, ὧν δὲ τυχεῖν, καὶ μείκνατας ὃν χρῆ χρόνον, ἄλλος δεύρο ταλίν ἤγεμον κομίζει εἰν τολλαίς χρόνων καὶ μακραίς περιόδους. ἢ τε ἢ ῥα ἐπορεία οὐχ ὡς ὁ Αἰσχύλος Τῆλεφος λέγει: εκείνου μὲν γὰρ ἄτλριν οἰμόν φησιν εἰς Ἀιδοὺ φέρειν, ἢ δ' ὅπτε ἁλή ὅτε μία φαίνεται μοι εἰναι. οὐδὲ γὰρ ἢν ἤγεμόνον ἔδοι, οὐ γὰρ τοῦ τίς ἄν διαμάρτοι οὐδαμώς μίας ὄδοι ὀρθῶς. τῶν δὲ ἔουκε σχίσες δ' καὶ περιόδους τολλίς ἔχειν· ἀπὸ τῶν ὀσίων τε καὶ νομίμων των ἐνδέχεται τεκμαιρόμενος λέγω. ἢ μὲν κοσμία τε καὶ φρόνιμος ψυχή εἶπται τε καὶ οὐκ ἄγνοιει τὰ παρόντα· ἢ δ' ἐπιθυμητικός τοῦ σώματος ἔχοις, ὅτε ἐν τῷ ἐμπροσθεν εἶπον, περὶ εἰκόνον πολίν χρόνον ἐπτομενὴν καὶ περὶ τοῦ ὀρατοῦ τόπον πολλὰ ἀντίστασα καὶ πολλὰ παθῶσα βία καὶ μόγις ὑπὸ τοῦ προστατευμένου δαιμόνος ὀχεται ἀγω- μένην, ἀφικομένην δὲ ὅπερ αἱ ἀλλαι, τὴν μὲν ἀκάθαρτον καὶ τὸ πεποικιών τοιοῦτον, ἡ φῶνον ἄδικον ἡμετὴρ ἢ ἀλλ' ἄττα τοιοῦτα εἰργασμένην, ἢ τούτων ἄδελφα τε καὶ ἀδελφών ψυχῶν ἔργα τυγχανεί ὄντα, τοῖς μὲν ἄτοις φεύγει τε καὶ ὑπεκτρέπεται καὶ οὕτω ἐκείμενος ὀὐε ἢγεμόν ἔθελε γίγνεσθαι, αὐτή δὲ πλανάται ἐν τάσις ἑκομενή ἀτομία, ἐώς ὅτι τις χρόνοι γένωται, ὅν ἐλθόντων ὑπ' ἀνάγκης φέρεται εἰς τὴν αὐτὴ προτευομαι σκηνὴν· ἢ δὲ καθαρὸς τε καὶ μετρίος τὸν βίον διεξελθόμενα καὶ νυνεμπόροντας καὶ ἠγεμόνων θεῶν τυχόντα ᾄχησεν τῶν αὐτὴ ἐκάστη τόπον προσήκοντα.

Those of the dead who led a middle sort of life, &c., and Those who repented of their sins, &c., 113D–114C:—

καὶ οἱ μὲν ἄν δοξοὺς μέσως βεβιωκέναι, πορευθέντες ἐπὶ τὸν Ἀχέροντα, ἀναβαίνετε δὲ αὕτως ὁχηματά ἐστιν, ἐπὶ τοῦτων ἀφευνοῦται εἰς τὴν λίμνην, καὶ εἰκεὶ οἰκουσὶν τε καὶ καθαρομενοι τῶν τε ἁδικημάτων διδόντες δίκας ἀπολύονται, εἰ τὸς τι θύμηκεν, τῶν τε εἰργασίων τίμως φέρονται κατὰ τὴν ἀξίαν ἐκαστός. οἱ δὲ ἄν δοξαν ἀνατίζοντες ἔχειν διὰ τὰ μεγαλύτερά τῶν ἁμαρτημάτων, ἱεροσυλίας πολλὰς καὶ μεγαλὰς ἢ φῶνος ἄδικος καὶ παρανόμους
P. 68. Ignorance, knowledge.—Cf. Sāṁkhya Kārikā, v. 44, “By knowledge is deliverance; by the reverse, bondage.”

P. 69. These eight things, &c.—Cf. the Commentary of Bhōjarājā to “The Yoga Aphorisms of Patañjali,” &c., v. xlv., also Gaudapāda’s Bhāshya to the Sāṁkhya Kārikā, v. xxiii. (pp. 83, 84), where he quotes the work of Patañjali (Pātañjala).

P. 69. Passing through several stages.—Cf. with these four stages of knowledge the “seven kinds of enlightenment’ in “The Yoga Aphorisms,” ii. v. xxvii., and Commentary.
The fourth stage of Alberuni's Patañjali corresponds to the seventh kind of Bhojadeva.

P. 70. In the book Gīṭā.—There is no passage like this in the Bhagavad-Gīṭā. The words, "pleasures which in reality are pains" (p. 71, 6), may be compared with Bhagavad-Gīṭā, v. 22: "For the pleasures that are born of (these) contacts are the wombs of pain."

A similar sentence recurs in another quotation from Gīṭā here on p. 78, 1 pen: "Pleasures of a kind which, in reality, are disguised pains."

P. 71. Socrates.—The following quotation is composed of the two passages, Phaedo, 65 b–d and 67a:—

"...paralambanōn aitēn, ἢ ἀκοὴ μῆτε ὠνίσ τότε κάλλος, ὡς ἔχει τὸν σῶμά του σώματος ἐπιχειρήματι τί σκοτεῖν, ὅλον ὅτι τότε ἔξαπταται ὅπερ αὐτοῦ. Ἀληθῆ λέγεις. ἄρ' οὖν οὐκ ἐν τῷ λογίζομαι, εἴπερ ποὺ ἄλλοθι, κατάδικον αὐτῇ γίγνεται τί τῶν ὄντων; Ὁ, λογίζεται δὲ γε ποὺ τότε κάλλος, ὡς εἶναι νοοῦτον ναὶ, ἀλλ' ὡς καὶ τὸ μάλιστα αὐτῇ καθ' αὐτήν γίγνεται ἐν εἴσοδο χαίρειν τῷ σῶμα, καὶ καθ' ὅσον ὄνταται μὴ κοινονόσα αὐτῷ μηδ' ἀπομεῖναι ὀρέγηται τοῦ ὄντος. Ἡ συνοίκων καὶ ἐνταῦθα ἡ τοῦ φιλοσόφου ψυχή μάλιστα ἀτμαίζει τὸ σῶμα καὶ φεύγει αὐτῷ, ὃτ' ἐκεῖ δὲ αὐτῇ καθ' αὐτήν γίγνεται.

67a.—καὶ ἐν θ' ἂν ἔχει, ὃτ' αὐτοῦ, ὡς αὐτοῖ, ἐγγυτάτω ἐσώμεθα τῷ ἑίδειν, ἐὰν ὃ τῷ μάλιστα μηδ' ὁμιλῶμεν τῷ σώματι μηδ' κοινονόσα, ὃ τῷ ἰθ' παῖσα ἀνάγκη, μηδ' ἀναπληρῶμεθα τῆς τοῦτον φύσεως, ἀλλὰ καθαρεύωμεν ἀπ' αὐτοῦ, ἔως ὅ ὁ θεὸς ἀυτοῦ ἀπολύσῃ ἡμᾶς, καὶ ὄντω μην καθαροὶ ἀπαλλαγόμενοι τῆς τοῦ σώματος αἴρομαι, μετὰ τοῦτον τῆς ἐσώμεθα καὶ γνώσομεθα δι' ἡμῶν πάν τῷ εἰλικρίνεις. τοῦτο δ' ἐστιν ἕως τοῦ ἀλλήθεις.

The words عدَّلَيْهِ مِنْهَا مِنْهَا (τον, 8) are barbaric Arabic = τότε ἔξαπταται ὅπερ αὐτοῦ. Probably the Syriac translation had a passive word with συνέχεον = ἐν' ἁυτῷ, and this was literally rendered in Arabic by مِنْهَا. The reading of the MS. مِنْهَا cannot be accounted for in any way.
P. 71. From the book Gītā.—The text is not found in the Bhagavad-Gītā.

P. 72. Kapila, for he was born knowing.—Cf. Colebrooke, "Essays," i. 242.

P. 72. Cupidity, wrath, and ignorance.—"The Yoga Aphorisms," ii. 3 seq., mention five affictions: ignorance, egoism, desire, aversion, and ardent attachment to life. Perhaps we may also compare Sāṁkhya Kārikā, v. lxiii., where seven modes are enumerated by which nature binds herself: virtue, dispassionateness, power, vice, ignorance, passion, and weakness.

P. 73.—The three primary forces are rajas, tamas, sattva.

P. 73. To stop all motions, and even the breathing.—Cf. on the stoppage of motion and the expulsion and retention of breath, "Yoga Aphorisms of Patañjali," i. xxxiv., and the notes of Râjendralâlâ Mitra.

P. 73. In the book Gītā.—The two quotations as given here are not found in the Bhagavad-Gītā. Only the comparison with the lamp occurs in vi. 19: "As a lamp sheltered from the wind does not flicker;" this is the wonted simile of the Yogin who is subdued in thought," &c.

Also the comparison with the waters of the rivers not increasing the ocean is found ii. 70: "He attains to peace into whom all desires enter as rivers enter into the ocean, which is ever filled, and (yet) remains within its bounds," &c.

P. 74. The following nine rules.—Five of these commandments are mentioned in "The Yoga Aphorisms," ii. xxx., and the other four seem to be identical with the five obligations mentioned in ii. xxxii.

P. 75.—Pythagoras.—I do not know the Greek original of this saying. The idea of the body being a fetter to the soul is frequently met with in the book of the Neopythagorean philosophers, as Apollonius of Tyana and others;


ef. Zeller, Philosophie der Griechen, iii. 2, p. 156. For two more sentences of Pythagoras, v. i. p. 85, where Alberuni states that he has taken them from Ammonius, v. note to p. 85.

P. 75. The book Sāñkhya says.—It is difficult to say whether the Arabic manuscript has अयो or अल, and not knowing a Sanskrit parallel to this saying, I am thrown upon conjecture. Preferring the latter reading, I translate: “Everything which man opines (i.e. on which he forms an opinion) is a terminus to him, for he does not go beyond it,” which may mean that as long as the thinking faculty of soul has not ceased, it is not liberated, has not attained moksha. Cf. Sāñkhya Kārika, v. lxviii.: “When separation of the informed soul from its corporeal frame at length takes place, and nature in respect of it ceases, then is absolute and final deliverance accomplished.”

Pp. 75, 76. Gītā.—The three quotations from this book are not found in the Bhagavad-Gītā.

P. 76. Socrates.—The quotations given here are found in Phaedo, 84E-85B:—

καὶ ὥς ἔοικε, τῶν κύκνων δοκῶ φαυλότερος ὑμῶν εἶναι τὴν μαντικὴν, οἱ ἐπειδὴν αἰσθώνται ὡτι δει αὐτῶν ἀποθανεῖν, ἀδοντες καὶ ἐν τῷ πρόσθεν χρώμα, τότε ήτι πλείστα καὶ μᾶλλον ἄδωντες, γεγονότες ὡτι μέλλονται παρὰ τῶν θεῶν ἀκίναι ὡσπερ εἰσὶ θεραπόντες, κ.τ.λ. ἀλλὰ ὄτε, οἷον, τοῦ Ἀπόλλωνος ὁτες μαντικοί τέ εἰσι καὶ προειδότες τὰ ἐν “Αἰδον ἀγαθὰ ἄδωνι καὶ τέρπονται ἐκεῖνην τὴν ἡμέραν διαφερόντως ἐν τῷ ἐμπροσθεν χρώμα. ἐγὼ δὲ καὶ αὐτῶς ἡγοῦμαι ὑμόδουλος τε εἶναι τῶν κύκνων καὶ ἱερός τοῦ αὐτῶν θεοῦ, καὶ οὐ χείρων ἐκεῖνων τὴν μαντικὴν ἔχειν παρὰ τοῦ δεσπότου, οὐδὲ δυσθυμότερον αὐτῶν τοῦ βίου ἀπαλλάττεσθαι.

In the middle a passage has been left out by Alberuni, or by the author of that edition of Phaedo which he used.

P. 76. In the book of Patañjali.—To the explanation of
the four parts of the path of liberation on pp. 76–80 I do not know a parallel from a Sanskrit source.

P. 77. In the book Vishnu-Dharma.—Cf. on this the note to p. 54. The Arabic text has not Parikshit, but Pariksha, which name is mentioned by Hall in a note to Vishnu-Purâna, iv., chap. xx. p. 154.

Pp. 78, 79. The book Gitā.—These three extracts are not found in the Bhagavad-Gítâ. The words, “He who mortifies his lust,” &c., compare with Bhagavad-Gítâ, iv. 21, “Void of hope, self-restrained in thought, performing merely bodily work, he contracts no sin.” Regarding the passage, “Pleasures of a kind which, in reality, are disguised pains,” v. note to p. 70.

The expression, the nine doors of thy body (p. 79, 3), is also found in Bhagavad-Gítâ, v. 13: “in the city of nine gates,” i.e. in the body. Cf. also Sāṃkhya Kārikā, v. xxxv.

Pp. 79, 80. The book Gitā.—These quotations cannot be compared with anything in the Bhagavad-Gítâ.

P. 81. Patanjali.—There is a certain resemblance between these words and the last of “The Yoga Aphorisms” (iv. xxxviii.): “Isolation is the regression of the qualities devoid of the purpose of soul, or it is the abiding of the thinking power in its own nature.”

Pp. 81, 82. Sāṃkhya.—The comparison with the wheel of the potter (not the silk-weaver) is also found in Sāṃkhya Kārikā, v. lxvii.

P. 82. In the book of Patanjali.—I have not found these two passages anywhere else. As to the faculties of the perfect Yogi, cf. “Yoga Aphorisms,” iii. 42, 44. 45.

P. 83. The Sāfī explain the Koranic verse, &c.—Being asked about the story of Dhulkarnaini (Bicornutus, i.e. Alexander), Muhammad says, “We (i.e. Allah) have made room for him on earth;” or, as Sale translates, “We established for him on earth,” which means, We have given him
a position of well-established authority or power on earth, and this authority or power is interpreted by Sūfi commentators in accordance with their tenets, perfectly harmonising with those of the Yoga philosophy.

Pp. 83, 84. Sāmkhya.—With the tale of the man travelling in the night with his pupils compare a similar one in Gauḍapāda’s Bhāṣya to Sāmkhya Kārikā, v. xxx. (on p. 106).

P. 85.—Ammonius, a philosopher of the Neoplatonic school, v. Zeller, Philosophie der Griechen, iii.e. 829 sqq. A Greek book of his which contains these extracts from Pythagoras and Empedocles is not known. He has been known to the Arabs as commentator of Aristotle: v. Wenrich, De Auctorum Graecorum Versionibus, p. 289; Fihrist, p. 147.

By Heracles in the passage, “Empedocles and his successors as far as Heracles,” is probably meant Heraclides Ponticus.

Pp. 85, 86. Socrates says.—The first extract is identical with Phaedo, 79D, the second is composed of 80B, 80A, 81A B, the order of the Greek text having been abandoned.

Phaedo, 79D. Οταν δέ γε αυτή καθ’ αυτήν σκοτή, ἐκείσεν ὑπεται εἰς τὸ καθαρὸν τὸ καὶ αἰὲ ὁν καὶ ἄθανατον καὶ ὡσαύτως ἐξον, καὶ ὁς συγγενῆς ὁσα αὐτοῦ αἰὲ μετ’ ἐκείνου τὸ γίγνεται, ὅταν περ’ αὐτή καθ’ αὐτῆν γένεται καὶ ἐξῆ αὐτῇ, καὶ τέκνα ταῦ τινος καὶ περὶ ἐκείνα αἰὲ κατὰ ταύτα ὡσαύτως ἔχει ἣτε τοιῶν ἐφαπτομένης καὶ τούτῳ αὐτής τὸ πάθημα φρονήσεις κέκληται.

80B. Σκόπεις δέ, ἐφη, ὅ Κέβης, εἰ ἐκ πάντων τῶν εἰρήμενών ταῦτα ἡμῖν ἐξελεύσεις, τῷ μὲν θεῷ καὶ ἄθανάτῳ καὶ νομῷ καὶ μονοειδεία καὶ ἀδιαλυτῷ καὶ ἀεί ὡσαύτῳ καὶ κατὰ ταύτα ἔχωντο ἡμῖν ὑμώμοιται εἰκαί φυσικῶς, τῷ δ’ ἄνθρω- πιν καὶ θυμῷ καὶ ἀνοσίᾳ καὶ πολυειδεί καὶ διαλυτῷ καὶ
μηδέποτε κατά ταυτά ἔχοντι εαυτῷ ὁμοίοτατον αὐτὶ εἶναι σῶμα.

80A. ἔπειδην ἐν τῷ αὐτῷ ὡςι ψυχῇ καὶ σῶμα, τῷ μὲν δουλεύειν καὶ ἀρχεσθαι ἡ φύσις προστάττει, τῷ δὲ ἀρχεῖν καὶ δεσπόζειν.

81 A and B. Οὐκοῦν οὕτω μὲν ἔχουσα εἰς τὸ ὁμοῖον αὐτῇ, τὸ ἅρμα, ἀπέρχεται, τὸ θείον τε καὶ ἀθάνατον καὶ φρόνιμον, οὐ οὐκομοῦν ὑπάρχει αὐτῇ εὐδαιμον εἰναι, πλάνης καὶ αἰνοις καὶ φόβων καὶ ἀγρίων ἔρωτον καὶ τῶν άλλων κακῶν τῶν ἀνθρώπων ἀπηλλαγμένη, ὡσπερ δὲ λέγεται κατὰ τῶν μεμνεμένων, ὡς ἁλθός τῶν λοιπῶν χρόνων μετὰ τῶν θεῶν διάγουσα; οὕτω φῶς, ὁ Κέβης, ἡ θάλας; οὕτω νη Ἑρ, ἐφ' ὁ Κέβης. Ἐωί δὲ γε, οὕτως, μεμασμένη καὶ ἀκάθαρτος τοῦ σώματος ἀπαλλάττεται, ἀτο τῷ σώματι αἰεί ξυνόουσα καὶ τούτῳ θεραπεύουσα καὶ ἐρώσα καὶ γεγονυτευμένη ὑπ' αὐτοῦ, ὡς τοῦ ἐπιθυμιῶν καὶ ἡδονῶν, ὡστε μηδέν άλλο δοκεῖν εἶναι ἀληθείς άλλ' ἡ το σωματοειδές ὑπ' τις ἐν ἀγαττῷ, κ.τ.λ.

Pp. 86, 87. Arjuna says.—The comparison of Brahman with an ásvattha tree is found in Bhagavad-Gîtâ, xv. 1–6, and x. 26.

The doctrine of Patañjali.—Ideas similar to these Sûfî sentences are found in Bhagavad-Gîtâ, vi. 28–31, describing the union of the soul with Brahman.

Pp. 87, 88.—On Abû-Bakr Ash-shibli cf. Ibn Khallikân, translated by De Slane, i. 511–513; Abulmahásîn, Annales, ii. 313. He lived in Bagdad, was a pupil of Junaid, died A.H. 334 = A.D. 946, in Bagdad, and was buried there. On Abû-Yazîd Albișâmtî cf. Ibn Khallikân, nr. 311. He died A.H. 261 = A.D. 875. Jâmi has articles on these two mystics with many quotations from them in his Nafahât-alîns (Lee’s “Persian Series,” the Nafahât-alîns, &c., or the Lives of the Sufis, by Jâmi, Calcutta, 1859, pp. 201 and 62).

P. 88. The Sûfi explain the Koranic passage (Sura 2, 68), &c.—“And when you had killed a person and were dis-

vol. II.
puting among yourselves (the one throwing the blame on the other), whilst God was bringing to light what you concealed, then we spoke: Beat him (the killed person) with part of her (the killed cow mentioned in the preceding"). In that case the killed person will again become alive and tell who murdered him. "Thus God brings to life the dead ones," &c. Cf. A. Geiger, Was hat Mohammed aus dem Judenthume aufgenommen? Bonn, 1833, p. 172. Muhammad has moulded this part of Sâra 2 from elements taken directly or indirectly from Numb. xix. 2 seq., and Deut. xxi. 2 seq.

The Sufies try to show by this sentence that the body must be mortified before the heart can become alive by mystic knowledge.


The reading of the MS. ٠َ٠ مس- is certainly wrong. The author means saumya = مس-، but it would have been better to write مس- in accordance with ٠َ٠ دمی- = daitya. As all the other words of this enumeration stand in the singular, it is not allowable to read this word in a plural form, like رهمن-، the Rishis, دهم-، the Pitris.

P. 90. In the book Gîtâ.—The first quotation on the prevalence of one of the three gunâs, saïtra, rajus, tâmas, is to be compared with Bhagavad-Gîtâ, xvii. 3, 4, seq., and xiv. 6-8 seq.

The second extract, "Belief and virtue," &c. I am inclined to combine with Bhagavad-Gîtâ, xvi. 3, 4. seq.

P. 91. People say that Zoroaster, &c.—The author was aware of the identity of the Persian dév (demon) with the Indian deva (god). It is in this way that he tries to account for the discrepancy of the meaning.


The second quotation, v. on p. 271:—

αξιοί βαλλειν ἕν ψευδώνυμον εἴρηκε μίκαν, ἐπειδὴ στάχυς ὀνομάζεται νάρδου· βουλεῖται δ' αὐτὴν εἶναι Κρητικήν, ἐνθα φησίν, ἕν ἀνέθρεψε χώρος ὁ τῶν Πίσση Ζήνα λοχεύσαμενος, ἐπειδὴ τὸν Δία φασίν οἱ μυθολόγοι κατὰ τὸ Δικταῖον ὄρος ἐν Κρήτῃ τραφίναν, κρυπτόμενον ὑπὸ τῆς μητρὸς 'Ρ'ας, ὅπως μὴ καὶ αὐτὸς ὑπὸ τοῦ πατρὸς τοῦ Κρόνου κατα-

P. 96. Europe, the daughter of Phænis, &c.—In the source whence the author drew his information about Greek legends, Greek, Hebrew, and Persian traditions seem to have been mixed together. It was synchronistic like the Chronicon of Eusebius, with which it is nearly related (note to p. 105), comparing the dates of Greek history with those of the Biblical and Persian history. Julius Africanus and Eusebius are the fathers of this kind of literature, but I do not know by whom the book which Alberuni used had been composed. Cf. Eusebi chronicon canonum quae supersunt, ed. A. Schöne, ii. p. 13 (Zeus), 26 (Cecrops), 32, 34 (Asterius); also the Syriac Epitome, p. 204, 206.

P. 96. The story of Alexander is derived from the romance of Pseudo-Kallisthenes (ed. Didot), which Eastern scholars have mistaken for a historic record.

"Man cannot oppose the gods" (p. 97, 1) = πρὸς πάντας ἄρ ἀνώμεθα οἱ βασιλεῖς, πρὸς δὲ τοὺς θεοὺς οὐ δυνάμεθα (ed. Didot, i. 9).

"When then he died," &c., "from a wound in the neck," &c. (p. 97, 4) = πεσὼν δὲ Νεκτανεβάδεις λαμβάνει φοβορὸν τραύμα κατὰ τοῦ ἴόχου αὐτοῦ (i. 14).
P. 97. Galenus.—Cf. note to p. 34.

P. 97. Aratus.—The author quotes the Phenomena and a commentary to them, which exhibits certain relations with the scholia edited by Immanuel Bekker, but is not identical with them. As I learn from my colleague, Professor C. Robert, this commentary is to be combined with the Catasterismi of Pseudo-Eratosthenes.

The first quotation from Aratus is v. 1 seq.

'Ex Διός ἀρχέμεσθα, τὸν οὐδὲντ' ἀνδρεὶς ἔόμεν
Ἀρρητὸν μεσταί ἐν Δίῳ τὰ ταῦτα μὲν ἀγαπά,
Πάσαι δ' ἀνθρώπων ἀγοραί, μεστῇ δ' ἡ ἡλιασσά
Καὶ λιμένες τάκτη δ' ἐν Δίῳ κεχρήμεθα τάντας.
Τοῦ γὰρ καὶ γένος εἰμέν· ὃ δ' ἤπιος ἀνθρώπους
Δεξία σημαίνει, λαοὺς δ' ἐπὶ ἔργων ἐγείρει,
Μυηνήσιν βιότου· λέγει δ' ὅτε βαλὸς ἄριστη
Βοών τε καὶ μακέλης· λέγει δ' ὅτε δεξίαι ὄραι
Καὶ φυτὰ γυρόσω, καὶ στέρματα τάντα βαλέονται.
Αὐτὸς γὰρ τάγη σήματ' ἐν αὐραμῷ ἐστήκεσιν,
Ἀστρα διακρίνει· ἐσέχθατο δ' εἰς ἐναυτὸν
Ἀστέρας, οἱ κ' ἐκ μάλιστα τετυγμένα σημαίνοντον
Ἀνθρώπιν ἔραμεν, ὅπ' ἐμπεθα τάντα φούσκαι.
Τῷ μὲν ἅμι πρῶτον τε καὶ ὅστιον ἑλάσκονται.
Χαῖρε, τάτερ, μέγα θαῦμα, μέγ' ἀνθρώπους ὄνειρα,
Αὐτὸς καὶ πρωτίριο γενεῖ, χαϊροῦσα δ' Μοῦσαι
Μελίχαι μάλα τὰς εἰς, κ.τ.λ.

P. 97. Commentary on the Phenomena of Aratus.—The following quotation from the Scholia Sangermanensia, p. 55, I owe to the kindness of Professor Robert: "Crates autem Jovem dictum cælum, invocatum vero merito ærem et satherem, quod in his sint sidera, et Homerus Jovem dixisse in aliqua parte cælum."

ὡς δ' ὅτι ταρφείαν νεφέλας Δίος ἐκτοτίστωνται
—Ilias, i. 3571.

The common tradition of this verse is—

ὡς δ' ὅτι ταρφείαν νεφέλες Δίος ἐκτοτίστωνται,
and thus it has been rendered by Alberuni. *Cf.* on the

P. 99. These twins, state and religion.— *Vide* note to p. 79.

P. 100. When Ardashr Ibn Bâbok.— *Cf.* with these ranks of the Persian nation under the Sasanians the
"Chronology of Ancient Nations," translated by Dr.
Edward Sachau, London, 1878, pp. 203 and 206; *Geschichte
der Perser und Araber zur Zeit der Sasaniden,* by Th. Nöldeke,
p. 437 seq.

P. 101. The Vaiśya who were created from.—In the
Arabic text, ר, 4, there is a lacuna, where originally stood
the words "from the thigh (*āru*) of Brahman. The Sūdra
who were created from." *Cf.* Manu, *Dharmaśstra,* i. 87,
mukha-bāhu-āru-paj-jānām.

P. 101. Hāḍṭ, Doma, &c.—Of these classes of outcast
people, the Badhatau are not known to me. The Caṇḍāla
are well known, called *Sandhiya* by Ibn Khurdādhbih
(Elliott, "History of India," i. 16). The Hāḍṭs and Dom
are mentioned by Colebrooke, "Essays," ii., "Enumeration
of Indian Classes," p. 169, note 3. On the latter (*cf.* Rom,
the name of the gipsies), v. "Memoirs on the History,
Folk-lore, and Distribution of the Races," &c., by Elliott,
edited by Beames, London, 1869, i. p. 84. Are the Bad-
hatu identical with the Bediyās, mentioned in the note
of Colebrooke just quoted?

P. 103. Vāsudeva answered.—The first quotation from
*Gītā* is identical with *Bhagavad-Gītā,* xviii. 41–45; the
second is similar to ii. 31–38.

P. 104.—The saying of Vyāsa.— *Vide* note to pp. 40–44.

P. 104. Vāsudeva.—This quotation from *Gītā* much
resembles *Bhagavad-Gītā,* ix. 32, 33.

P. 105. Minos.—I cannot acquit the book on ancient
history which Alberuni used of the blunder of having
split the Minos of Greek traditions into two persons, a
Minos and a Mianos (*sic*). *Cf.* on this source note to p. 96.
At the time of Darius, &c.—Except the synchronism of Persian history, the whole passage relating to Numa Pompilius may be derived from Eusebius, Chronicon, ii. 32:—

Noumas mete Ὄμησον βασιλεύσας Ὄμησον πρῶτος νόμους Ὀμησιος εἰσήγαγεν. [ὁ αὐτὸς τὸ Καπετάλιον ἐκ θεμελίων ἐκκοδώμησεν.] ὁ αὐτὸς τῷ ἐναυτῷ ὑπὸ μῆνας προσέθηκε, τόν τε Ἰακωβάμον καὶ τὸν Φεβρουάριον, διεκα- 

Π. 105. Plato.—These extracts from Plato's Leces are the remnant of an Arabic translation. We give the Greek text for the purpose of comparison:—

I. 1. Ἀθήναιος. Θεός ἐν τις ἀνθρώπων ὕμνη, ἡ ξένη, εἰλήφη τῆς αἰτίας τῆς τῶν νόμων διαθέσεως. Κλείνεια. Θεός, ἡ ξένη, θεός, ὡς γε τὸ δικαίωταν ἐπείνα, παρὰ μὲν ἦν Ζεύς, παρὰ δὲ Λακεδαιμονίας, ὡδὲ ὡδ' ἔστιν, ὁμιλεῖ ἐν τούτῳ Ὄμησον.

I. 6. Ὀστερ τὸ τε ἀληθεῖα, οἴμαι, καὶ τὸ δικαίωμα ὑπὲρ γε θείας διαλεγόμενος λέγεται, οὐχ ἐν τῷ ἁρετῆς τι μέρος καὶ τῶτα τὸ φαντάσματον εἶθε θείῳ διάθεσιν, ἀλλὰ πρὸς τὰς ἁρετής, κ.τ.λ.

I. 6. οἱ Κρητικῷ νόμῳ οὐκ εἰσὶ μάτην διαφερόντως εἰν πάσιν εὐδοκίμω οἷς Ἐλληνικὰ ἡχοῦσι γὰρ ὅρθος, τοὺς αὐτοῖς χρυσοῦς εὐδαίμονας ἀποτελοῦσιν ἀπαντά γὰρ τὰ ἀγαθαὶ πορίζουσι.

II. 1. θεοὶ δὲ, οὐκετέρας τὸ τῶν ἀνθρώπων ἐπίτοιον περικά γένος, ἀνακτών τε αὐτοῖς τῶν ποιῶν ἔταξαντο τὰ τῶν ἑορτῶν ἀμοιβάς, καὶ Μοῦσα 'Ἀπόλλωνα τῆς μουσαγήτη καὶ Δίων ύπεορταστὰς ἔδωσαν.

II. 1. ἢμίν δὲ οὕς ἔπεμον θεοὶς ἐγχορηγοῦντας δεδόθαι, 

tοῦτον εἶναι καὶ τοὺς δεδοκίτας τῆς ἐνυπνίμων τῷ καὶ ἐναρμόνων ἀσθονίβα μεθ' ἰδίων, ὡδ' ἡ κνείν τοῖς ἠμῶν καὶ ἑορτήθην ἢμῖν τοῦτον, ὡδ' δ' τοῖς ὁρχήσεις ἀλλήλους ἐνειροῦς, χοροῦς τε ἐνυμακέναι το ταρὰ τῆς χαρᾶς ἔμφυτον ὅμοι.

Vyāsa.—His mother is Satyavatī: v. Vishnu-Purāna, i.e. The birth of Vyāsa is mentioned in Mahābhārata Adiparvan, v. 3802.

P. 108. Panchār, better Panchār.—The author means the alpine countries of the Hindukush between Kashmir and a line from Faizabad to Kabul, i.e. the Hazāra country, Svāt, Citrāl, and Kafiristan. It is well known that polyandry exists among the Tibetan tribes in the Alps between Kashmir and Tibet, but I am not aware whether it is also found among the inhabitants of the more western extension of the Himālaya which he mentions, e.g. among the Siyāhpūrsh. On polyandry in the Panjab v. Kirkpatrick in “Indian Antiquary,” 1878, 86.

The Panchār mentioned by the author is the tributary of the Kābul-Rūd. Another Panchār (sic) is mentioned by the Arab geographer Yākūt as a city in Bactriana with rich silver mines.

Among the heathen Arabs.—Cf. here i. 185.


P. 109. Barshawār the Girushā.—This seems to be a mistake, and I propose to read, as I have done in the edition of the Arabic text, بدرام رخته, i.e., the Shāh of Padashvārgir or Prince of Tabaristān (as e.g. Gīlānšāh=the Shāh of Gīlān). Cf. P. de Lagarde, Beiträge zur Baktischen Lexicographie, p. 50; Sachau, “Chronology of Ancient Nations,” p. 47, 19, and note; Nöldeke, Geschichte der Perser und Araber zur Zeit der Sassaniden, p. 452.


P. 113. Ambarīsha.—The story of this king seems to have been taken from the Vishnu-Dharma, v. note to p. 54. Probably Ambarīsha, the son of Nabhaṇga, is meant,

P. 116. Nārada.—The story of this saint, a Moses in India, is not known to me from other sources.

P. 116. Jalam Ibn Shaibān.—The pronunciation of the former name is conjectural, the history of this Karmatian chief unknown. The expedition of King Māhmūd against Multān took place A.D. 1006, in the ninth year of his rule, the seventh year of his usurpation of sovereignty, in which he had left out the name of his Sāmāni liegelord on the coins and in the public prayer, and had received the investiture, a robe and a title, from the source of all legitimacy in the Muslim world, the Khalif Alkādir, the great enemy and persecutor of the Karmatians. Cf. on this expedition Elliot, "History of India," ii. p. 441.

P. 116, l. 21.—There is an error in the calculation of the years. From the end of the Krita-yuga up to the year 4132 of the Kaliyuga there have elapsed—

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Of the Tretā-yuga</td>
<td>:</td>
<td>:</td>
<td>1,206,000</td>
</tr>
<tr>
<td>Of the Dvāpara-yuga</td>
<td>:</td>
<td>:</td>
<td>864,000</td>
</tr>
<tr>
<td>Of the Kaliyuga</td>
<td>:</td>
<td>:</td>
<td>4,132</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td>:</td>
<td>:</td>
<td><strong>2,164,132</strong></td>
</tr>
</tbody>
</table>

As Alberuni gives but 216,432 years, it seems he has omitted by inadvertence the cipher 1 (Schram).

P. 117, l. 7.—The above supposition is confirmed by this passage; it ought to be the 132 years instead of the 432 years. One can consider 132 years as a kind of arbitrary equivalent for the sum of about 100 years, but 432 years cannot be an equivalent for about 100 years (Schram).

P. 117, l. 10.—It must be 2,164,000 instead of 216,000 (Schram).

P. 117. Vardhamihira says.—This extract is a translation of Brihat-Samhīd, chap. lviii. §§ 30–48, 56–57, on the fabrication of the idols (p. 117–120); chap. lviii. §§ 4952, on the consequences of faults in the construction of idols (p. 120); chap. lx. § 19, on the various classes of priests (p. 121); chap. lx. §§ 4, 5, on the effects of the
idols (p. 121). The order of the single verses is to some extent different from that of the Sanskrit text as exhibited in the edition of Kern. In the Arabic text, p. "سلس السيف واللابسون ("the sword and shield").

P. 122. Gilda.—I do not know similar passages in Bhagavad-Gilda. The first quotation distantly reminds one of Bhagavad-Gilda, iv. 25.

P. 123. Plato.—This quotation shows considerable confusion in the rendering of the Greek text. Cf. Leges, iv. 8.

προτιν μὲν, φασμέν, τιμᾶς τὸς μετ' Ὀλυμπίανος τοῖς καὶ τοῖς τῆς πολιν ἔχοντας θεοὺς τοῖς χθονίωσ ἀν τις θεοὶ ἄρτια καὶ δεύτερα καὶ ἀριστερὰ νέων ὀρθότατα τοῦ τῆς εισεβείας σκοποῦ τυγχάνων, τοῖς δὲ τοῦτον ἀνωθεν τὰ περιττὰ καὶ ἀντίφωνα τοῖς ἐμπροσθεν ρηθέντι νῦν ὅτι μετὰ θεοὺς δὲ τοῦτῳ καὶ τοῖς δαιμοσίν ὦ γ' ἐμφρων ὀργιάζοι τ' ἀν, ἡρωι δὲ μετὰ τούτοις ἐπακολούθεις δ' αὐτῷ ἰδρύματα ἱδία πατρφῶν θεῶς κατὰ νόμον ὀργιαζόμενα· γονέων δὲ μετὰ ταῦτα τιμαί ἔφοντον, ὡς θέμις, ὄφελοντα ἀποτίνευ

The underlined words are the original of the Arabic quotation. The translator has rendered δαιμοσίν by θεί (gods), ἡρωι by σκιδιντα, by which elsewhere the word Μούσας is translated, and ὀργιαζον by (instead of سب فب باسم) He seems to have mistaken the meaning of the word ἐπακολούθεις, translating in this way: “they (the ἰδρύματα = "أعمال السب" اعمال السب) follow in rank after the πατρφος θεος,” i.e. you shall not put the πατρφος θεος in the first place, but worship them secundo loco.

P. 123. Galenus.—Vide note to p. 34.

P. 126.—The tradition of Šaunaka from Venus (so the Arabic text), i.e. Sûkra, is perhaps taken from the Vishnu-Dharma. vide note to p. 54.

Vishnu-Pûrâna.—Compare this quotation with book iii. chap. ii. p. 29 (ed. Wilson-Hall). The Great Bear is called the Seven Rishis in Sanskrit.
P. 126. *Vasuktra.*—This reading does not quite accurately correspond to the Arabic signs, which must be read *Vasuktra.* I have preferred the former, because it is mentioned in the St. Petersburg Dictionary as the name of a man who occurs in the *Veda* as a poet of Vaidic hymns.

P. 127. *Galenus.*—The quotation from Galenus must be compared with the following passage in his *peri syntheosew farnmakan catē genē* (ed. Kühn, tom. xiii. p. 995):—

> ἡφέσθη δὲ ὑπὸ Μενεκράτους, κ.τ.λ. ἰατρικὸν φάρμακον. ἐπιγραφαίσι δὲ τοῦ βιβλίου, κ.τ.λ. αὐτοκράτωρ ὀλογράμματος. αὐτοκράτωρ μὲν, ἐπειδὴ τούτῳ προσπεφώνηται, ὀλογράμματος δὲ διότι χωρὶς χαρακτήρων ἰδίως ταῖς συλλαβαῖς γέγραφαι β' καὶ γ' καὶ δ' καὶ ε' καὶ τῶν ἀλλων ἀριθμῶν ἑκαστος, κ.τ.λ. τούτῳ δ' ἐπραζεν ὁ Μενεκράτης, ἐπειδὴ παλλάκις οὐ μόνον ἀκόντων ἀμαρτάνεσθαι συμβαίνει κατὰ τὰς γραφὰς, ἀλλὰ καὶ διὰ φθόνον ἐκόντων ἑών, κ.τ.λ.

That which I have underlined forms the text as given by Alberuni.


P. 128. *A peculiar kind of recitation.*—This is a description of the four *pāṭhas, padapāṭha, kramapāṭha,* &c. Cf. Colebrooke, "Essays," i. 18.

P. 128. *Kāṇḍān.*—The word كاٌدی evidently refers to the divisions of the Yajurveda called *kaṇḍikā.* "The text of the Yajurveda is composed of *Kāṇṛt,* and its name (the name of Yajurveda? what name of it?) is derived from it (from *kāṇṛt*?), i.e. the collection (or totality) of *kāṇṛt.*" It does not appear which one of the names of *Yajurveda* is here meant by the author as having been derived from
kāndikā. Is there a name of Yajurveda like kāndika or kāndin, meaning consisting of kāndikās?

In kāndī = kāndikā the cerebral avian is rendered by an Arabic r, as in kūdāvā, yūdī, garūda, dravīdā, nādī, vīnādī, vaidārya, &c. The termination in long ə seems to be characteristic of the vernacular form of Indian speech, and is probably a survival of the more ancient termination əka, əka. Cf. R. Hörnle, "Comparative Grammar of the Gaudian Languages," § 195, 203, 205.


P. 129. The well-known story.—It is told by Alberuni himself, i. p. 396.

P. 131. Vishnupurāṇa.—This index of the Purāṇas occurs in book iii. chap. vi. p. 66, 67. In the Arabic text ṣ, 12, read instead of ḥ.

P. 131. Smṛiti.—The author erroneously calls it a book. It is the literature on law, and the twenty sons of Brahman here mentioned are authors of Dharmaśāstras. Cf. on smṛiti (opp. śruti), Colebrooke, "Essays," i. 337, 466; A. Weber, Vorlesungen, p. 296, note 327; Indische Studien, i. 232.

Alberuni sometimes quotes the book Smṛiti. However, he had not the book himself, but transferred those quotations from the Brahmasiddhānta of Brahmagupta. In reality it is the latter author who quotes it. As, according to him, the book smṛiti was composed by Manu (v. here ii. 110, 111), he means the Dharmaśāstra of Manu. This law code is only once clearly referred to by Alberuni (ii. 164), but in a manner which makes me think that it was not in his hands. On Manu, as the author of the great Mānasā (a work on astronomy and astrology?), v. p. 157.


Śāṅkhya.—Vide the same note.

Patanjali.—Vide note to p. 27.

Nyāyadhāsā.—This my transliteration will perhaps seem doubtful, as the contents of the book have
no relation to the Nyāya philosophy or logical system of Gautama (cf. Colebrooke, "Essays," i. 280), but are clearly identical with the Mīmāṃsā philosophy of Jaimini, who is here mentioned a few lines farther on. However, I do not know another mode of reading the word. That Kapila was the author of such a work does not seem to be known.

Mīmāṃsā.—Cf. Colebrooke, "Essays," i. 319. In opposition to Kapila, Jaimini teaches that the Veda is primeval and superhuman. This theory and the discussions through which it has passed are also found in the history of Islam applied to the Koran. According to Islam, the Koran too is primeval and superhuman.


Bṛhaspati is the founder of this school; his sūtra is quoted by Bhāskara-ācārya. The Bṛhaspatyasūtram is mentioned by A. Weber, Vorlesungen, p. 263.


Vishnu-Dharma.—Vide note to p. 54.

P. 132. Bhdrata, i.e. Mahābhadrata, which is repeatedly mentioned by Alberuni. Bhagavad-Gītā is a part of it (i. 132). The story of the birth of Vāsudeva and of his five brothers (i. 401-406) is taken from Mahābhadrata.

I am not quite certain whether Alberuni had a copy of the work. When giving quotations from the book, he does not mention it, which he probably would have done if he had had it in hand.

P. 133.—With the index of the chapters of Mahābhadrata cf. Monier Williams, "Indian Epic Poetry," p. 91 seq. The list of Alberuni exhibits some remarkable differences.

P. 135. Pāṇini.—The reading of the MS. is pāṇrīti,
which I cannot explain. If پارنی is the correct reading, we must remember that in the sound ن there is an admixture of the sound ر. So Hörnle, "Comparative Grammar," p. 15, says: "The cerebral ن contains the sound of ر, being somewhat like رن." In this way Alberuni has transliterated the ن in the word دانیج, which he writes دانیج. Accordingly we should expect to find پارنی, but the author seems to have written پارنین, паррини.

P. 135.—The word هکمی = kishyakuta, has been deciphered by Professor Kielhorn, Göttingen.

P. 136. Sātavadana.—Other forms of the name are Sātavadana, Sālivadana (Hemacandra, i. 211); but Alberuni clearly notes the pronunciation Samaivadana, which is not known to me from other sources.

P. 136.—Instead of māudakam read mōdakam = māudakam.

P. 136.—Abūl’aswad, &c., is, according to the literary tradition, the originator of their grammatical science. Cf. G. Flügel, Grammatische Schulen der Araber, p. 19 seg.

P. 136. Chandas.—In translating the chapter on metrics, I have derived much help from Colebrooke, "Essays," ii. p. 57 (on Sanskrit and Prākrit poetry), and from Weber’s edition of the Sūtras of Piṅgala (Indische Studien, vol. viii.). Alberuni, however, seems to have used other sources and to have followed another system, which has greatly increased the task of the translator.

P. 137. Piṅgala.—What are the Sanskrit forms of the names ācalītu, ākīśtu, āuliya’dnu, āuliya’dnu?

The chapter of Brahmagupta’s Brahmaśiddhānta, of which the author here (p. 147-150) communicates a few extracts, is chap. xxi., On the calculation of the measures of poetry and on metrics, v. i. 155.

P. 138.—Alkhalil, also mentioned i. 147, is in Arabic literature the father of the science of metrics. Cf. G. Flügel, Grammatische Schulen der Araber, p. 37.

Sabab.—Cf. Freytag, Arabische Verskunst, p. 64, 65.
P. 140. Madhya.—I do not know this term in Sanskrit, and the signs \( \frac{1}{2} \) admit of different transliterations. Both the terms madhya and madhu are used in metrical terminology, but with different meanings. Cf. Colebrooke, "Essays," ii. 141 (madhu), and ii. 136, 141 (madhyd).

P. 141.—Haribhāṭa ?—This name is not known to me as that of an author of a lexicographical work. The MS. clearly writes hariuddu, which may represent various other forms of Sanskrit names.

P. 141.—The single letters \( m, y, r, \) &c., denoting the single feet, are mentioned by Colebrooke, "Essays," ii. 63.

P. 142. Place the numeral 2, &c.—The rule, as explained in ll. 4, &c., differs from that one which is followed in the example (ll. 11-14), in so far as in the former place the subtraction of 1 ("and from the product (4) he subtracts 1") has been omitted. But even if we correct the text of the rule according to the exemplification, it cannot be correct, and we agree with Alberuni that something in the manuscript must have been wrong (also in the passage below, ll. 30-34). For it can be applied not to all eight feet, but only to two, viz., to

\[
\text{|| < (2 \times 2 = 4 - 1 = 3 \times 2 = 6 - 1 = 5)}
\]

and to

\[
\text{| < | (2 \times 2 = 4 - 1 = 3 \times 2 = 6),}
\]

i.e. these two feet occupy respectively the fifth and sixth places in the arrangement on p. 141 (below).

P. 143. The Greeks, too, &c.—The comparison with Greek metrics is unintelligible, as something must have been dropped in the Arabic text.

P. 143. Consonant or syllable.—I suppose the author means syllable. The Arabic word حرف has the same inconvenience as Sanskrit akṣhara of meaning both syllable and sound (mostly consonant).

P. 143. Āryā.—This reading is a conjecture of mine, as the MS. has āral, which I cannot explain. The description given by the author seems to be applicable to the
Årya metre, which could be known to him from his study of Brahmagupta's Brahmasiddhānta. Cf. Colebrooke, "Essays," ii. 66.


Khajf.—This Arabic metre, represented in European fashion, is the following:

- - - - | - - - - | - - - -

P. 145. Vritta.—On the metre of this name v. Colebrooke, "Essays," ii. 145. However the signs ꞑ (b-r-t) admit of various other ways of reading. The MS. has britu.

P. 147. Śloka.—On the rules relating to this metre v. Colebrooke, "Essays," ii. 107.

P. 150. I have only seen a single leaf.—This translation is to be replaced by, "I have only studied a single leaf."

P. 151. Galenus.—The quotation is found in his περὶ συμβάτων φαρμάκων κατὰ γένη (ed. Kühn), tom. xiii. p. 996:

\[\text{ἄλλῳ ἐπὶ τῶν χυλῶν ὑπὸ Μενεκράτους εὑρεθεῖσα}
\[\text{διὰ τὸν ὁμομετρίων στοιχείων ὑπὸ Δαμοκράτους}
\[\text{γέγραται.}


Varāhamihira.—Vide note to p. 54.

Pp. 153, 154. Brahmagupta.—His work, the Brahmasiddhānta, has been very largely used by Alberuni. It exists in manuscript, but has not yet been completely edited or translated. Alberuni translated it into Arabic when he wrote the Indica (A.D. 1030). We do not know whether he ever finished it.

Brahmagupta was only thirty years of age when he
wrote this work. He is accused of the sin against conscience of having propagated futilities and lies in order to please the bigoted priests and the ignorant rabble of his nation, in order to avoid those dangers in which Socrates perished. Vide chap. lix. on eclipses, and specially ii. 111. Besides, Alberuni accuses him of undue animosity against Āryabhaṭa (i. 376).

Brahmagupta holds a remarkable place in the history of Eastern civilisation. It was he who taught the Arabs astronomy before they became acquainted with Ptolemy; for the famous Sindhind of Arabian literature, frequently mentioned, but not yet brought to light, is a translation of his Brahmasiddhānta; and the only other book on Indian astronomy, called Alarkand, which they knew, was a translation of his Khandakāhādyaṣṭaka.

The latter work (here ii. 7) is also called Karanakhandakāhādyaṣṭaka (i. 156). It was explained in a special commentary by Balabhadra (ii. 187).


Notes from Varāhamihira's Pañcasiddhāntikā have been edited by G. Thibaut in the "Journal of the Asiatic Society of Bengal," 1884, vol. liii. p. 259.

Sindhind is mentioned ii. 191, as the only source of the information of Muslims on Indian astronomy and astrology. According to ii. 90, the Indian computation of the heliacal risings of the stars and the moon is identical with that given in Sindhind. It is called the great sindhind (Siddhanta) ii. 18.

Alberuni has written a treatise on it. See preface to the Arabic edition, p. xx.

P. 154. Pulisa.—This name and Paulisa are written Puḷīṣa and Puḷīṣa in Utpala's commentary to the Samhitā of Varāhamihira; but as Alberuni writes them constantly with a ப, not ப, I am inclined to believe that he and his Pandits pronounced Pulisa and Paulisa. Alberuni has
drawn from the Puliscasiddhánta almost as largely as from the Brahmasiddhánta, and was occupied with translating it (v. also i. 375).

The relation between Pulisa and Paulisa is this:—

Paulisa is the sage who communicates his wisdom in this Siddhánta. He was a native of Saintra, i.e. Alexandria. Pulisa is the redactor or editor of the book. The one as well as the other is called Πολύς and Πολύς, Greek (not Ὄμηρος, Byzantine Greek). "Pulisa says in his Siddhánta that Paulisa the Greek had mentioned somewhere," &c., i. 266.

A commentator of this Siddhánta is mentioned i. 339 med., where I now prefer to translate: "The commentator of the Siddhánta of Pulisa," &c.

Pulisa quotes Parāśara (ii. 208), and is himself quoted by Āryabhaṭa jun. (i. 316).

Paulisa is quoted by Brahmagupta, i. 374 (v. note).


P. 156.—Āryabhaṭa senior is clearly distinguished from Āryabhaṭa junior, who is mostly called "that one from Kusumapura," i.e. Pātaliputra (Patna). Alberuni knows him only through the quotations in the works of Brahmagupta. He mentions two of his works, Daśagītikā and Āryāsītaśata, which have been edited by Kern, Ārya-bhaṭiyam, 1874. Cf. Dr. Bhāu Dāji, "Brief Notes on the Age and Authenticity of the Works of Āryabhaṭa," &c., p. 392.

P. 156. Balabhadra.—Of his works are mentioned:—

(1.) A tantra.
(2.) A Saṁhitā.
(3.) A commentary of the Brhajjātakam of Varahamihira (p. 158).
(4.) A commentary to the Khaṇḍakhādyaka of Brahmagupta.
(5.) He is supposed to be the author of the book Khaṇḍakhādyakaṭippā.

Alberuni always calls him the commentator, and frequently quotes him without indicating from what particular book he quotes. He gives on his authority the latitude of Kanoj and Tāneshar, and passes harsh judgment on him i. 244, 275. Cf. also note to p. 27.
P. 156. Bhāmrajās (also on p. 157).—The Arabic MS. writes Bahāmrajus, which I cannot identify. A slight alteration (of बाहमरजु to बाहनरजु) would give Bhānrajās, which name was suggested to me by G. Bühler.

P. 156. Kdża-babayd.—As kāra means rice, बाब, babayd, must mean mountain. Is it a vernacular form for parvata?

P. 156. Khanda-khadyaka-tappd.—The MS. has tappd or tippd (tippd), of which I do not know the Sanskrit form. जिस changed to जिस would be = tippant or commentary.

Vijayanandin.—Alberuni quotes from him a method for the computation of the longitude of a place (i. 313), a note on the dominants of year, month, and lord (i. 343), on the circumpolar stars (ii. 90), an ahāranya rule (ii. 49, 50). An astronomer of this name is mentioned by Dr. Bhān Dājī as anterior to Śrīśeṣa, the author of Romakasinḍhaṭta: v. "The Age and Authenticity of the Works of Āryabhata," &c. ("Journal of the Royal Asiatic Society," 1864), p. 408.

P. 156. Bhadatta († Mihdatta).—The MS. reads बहदैता. Bhadatta is mentioned by Kern in the preface to his Brhat Saṅhitā, p. 29. Alberuni quotes from the work of Vitteśvara a note on the motion of the Great Bear (i. 392), on the mean places of the stars (ii. 60), on the diameters of sun and moon (ii. 79), the latitude of Kashmir (i. 317), the era used in the book (ii. 7). It must have been translated into Arabic before Alberuni wrote the Indica, because he complains that that part of the book which he had was badly translated (ii. 55).

P. 157. Utpala.—Besides these two Kāraṇas, he has composed—
(1.) A commentary to the great Mdnasa composed by Manu.
(2.) The Praśnacidāmaṇi (p. 158).
(3.) A commentary to the Saṅhitā of Varāhamihira (p. 298).
(4.) The book Srādhava (?), whence Alberuni has taken metrological and chronological notes (p. 334, 336, 361). Cf. on Utpala Kern's preface to his Brhat Saṅhitā, p. 61.
The book-title ṛdhunārākaraṇa, i.e. breaking of the Karāṇas, seems to be corrupt. One expects the word karāṇa in the first place, and a word for breaking in the second.


P. 157. Puñcala (?).—The author quotes from him a statement relating to the precession of the equinoxes; he speaks highly of him, and says that a theory of his was adopted by Utpala (i. pp. 366, 367).

I do not know of such an Indian name. The nearest approach to it is Muñjāla, that of an astronomer quoted by Colebrooke, "Essays," ii. 330, 332.

P. 157. Bhāḍila (?).—The MS. has baḥattal, and I suppose that the correct reading is Bhaṭṭila. The name is perhaps a derivation (diminutive?) from bhaṭṭa, as kumārila from kumāra, pushāṇḍhila from shāṇḍha. Alberuni quotes him, ii. 208, in the chapter on the yugas.


P. 158. Of Varāhamihira, &c.—This author has composed not only the Shatpañcāhikā and Hordpañcāhotriya (?), but also the Yogayādṛā, Tikanāyādṛā (?), and Vivadhapaṭṭala: v. Kern, Brhat Sañhitā, preface, pp. 25, 26; his translation of the Yogayādṛā in Weber's Indische Studien, x. 161.

The name of the author of the book on architecture is missing in the Arabic text. If it was not likewise a work of Varāhamihira's, it may have been composed by Nagnajit or Viśvakarman: v. Kern, l. c. p. 51.

P. 158. Srūḍhava.—I do not know the corresponding Sanskrit form. It seems to be some relative of śrutī. If śrutayas had currency in the meaning of traditions, I should identify it with srūḍhava. Is it = śrotaya?

The word is the title of two different books, one by Utpala from Kashmir (v. note to p. 157), and the one here mentioned, on oṁna and portenta, lucky and unlucky
days, &c. It probably contained the names of the twenty-four ġord (i. 344); it mentioned the names of the third parts of the day (ii. 120), the names of the viśīṭi (ii. 201), the unlucky days of the year (ii. 192), the name of Viṁramādīṭya (ii. 6; vide note to the place).

The reading of the word ǧak as Bangīla is probably not correct. Is it = punyakīla?

P. 158. Gudhādana (†), in the Arabic jūrdāman.—As the word is translated by unknown, one thinks of a derivation of the word guḥ—t to conceal (v. guḥā). The Arabic characters may also be read cūdāman. If praśna jūrdāman (?) really meant what Alberuni says, one would expect guḥapraśna.

P. 158. Sangahila, Pitrudāna.—I do not know the Sanskrit equivalents of these two names. The former might be a word like śrīnkhaṇa or śrīṅgāla (Synceillus?). Prithādāka is the author of a commentary on the Brahmashidānta: v. Colebrooke, “Essays,” ii. 411.

P. 159. Caraka.—The ancient Arabic translation of his medical work is sometimes quoted by Alberuni, and to judge from these quotations the translation was not free from blunders nor the manuscript-tradition free from the effects of carelessness: v. a quotation on weights, i. 162, 163; one on the origin of medicine, i. 382. Cf. Weber, Vorlesungen, pp. 284, 289.

P. 159. Puṇcatantra.—Cf. on this book and on Ibn Almukaffa’s share in its translation, Benfey’s introduction to his translation of the Puschatantra (Leipzig, 1859). On the translations of the book and on the influence which King Mahmūd of Ghazna has had on its fate, cf. Colebrooke, “Essays,” ii. 148. The work of Ibn Almukaffa is that one edited by S. de Sacy, 1816.

1874; A. Weber, Ueber ein Fragment der Bhagavatī, II. Theil, p. 265 note.

The weight of one dirham = one-seventh mithkāl, dates from the time of the Khalif Omar.

The weight of one dirham = seven dānak, is peculiar to India in the author's time, for in general one dirham = six dānak. Cf. Sauvare, Matériaux pour servir à l'Histoire de la Numismatique et de la Métrrologie Musulmanes, Paris, 1882, pp. 43, 81, 98; on the mithkāl, p. 35; on the fuls, p. 108. On the ancient denars of Sindh cf. Elliot, "History of India," i. 11 (Abū Zaid), 24 (Mas'ūdi), 35 (Ibn Ḥaukal).

P. 162. Varāhamihira.—This passage is Brihat Samhitā, chap. lviii. v. i. The following quotation on yava, andī, mdshā, and suvarna, I do not find in his Samhitā.

P. 162. Caraka.—The Arabic translation of this book is not extant. The Indian words which occur in the extracts from this book are not so accurately written as those in Alberuni's own work, and offer more difficulties in the way of identification: v. note to p. 159.

P. 162. Jivāśarman.—The words "As I have been told (by him)," may better be translated "As I have heard it from him." Alberuni does not quote from a book of his, but only says "he has told, mentioned," "I have heard from him." Accordingly, he seems to have been a contemporary and personal acquaintance of Alberuni's, in the same way as Śripāla. Alberuni relates on his authority details regarding a festival in Kashmir and Śvāt, ii. 181, 182. Besides, a Jivāśarman is mentioned as the author of a Jātkam, i. 157, who seems to have been a different person altogether, and lived before the time of Varāhamihira: v. Kern's Preface to Brihat Samhitā, p. 29.

P. 164. Varāhamihira.—This quotation seems to correspond to Brihat Samhitā, chap. xxxiii. v. 2. At all events, it is the passage to which Śripāla refers.

Śripāla.—Alberuni quotes him a second time, i. 240, where he speaks of a star, šāla, as observed in Multān, which people considered as unlucky, and ii. 209, he copies
from him the names of the twenty-seven yogas. Perhaps Śripāla was a scholar living at Multān in the time of the author. Alberuni does not mention a book of his.

P. 165. Śiṣupāla.—The story of Kṛṣṇa's killing Śiṣu-
pāla (Śiṣupālabadha) is told in the Mahābhārata, Sabhā-
Parvan, v. 1336 seq.

P. 165. Alfasārī is one of the fathers of Arabian literature, the first propagator of Indian astronomy among the Arabs. His works are, as far as I am aware, not extant. Probably this Muḥammad Ibn Ibrāhīm Alfasārī was the son of Ibrāhīm Ibn Ḥabīb Alfasārī, the first constructor of astrolabes among the Arabs, who as a surveyor partook in the foundation of Bagdad. Cf. Fīhrist, p. 147. Gildemeister, in his Scriptorum Arabum de rebus Indicis loci, p. 101, gives the translation of an article of Alkifṭī on our Fazārī.

According to the quotations of Alberuni (v. index s. v. Alfasārī), this scholar used the word pala in the meaning of day-minute; he reckoned the circumference of the earth in \( \omega \gamma \), i.e. yojanas; he (together with Ya'kūb Ibn Ṭārīk) mentions a town, Tāra, in a sea in Yamakoṭī; he gives a method for the computation of the longitude of a place from two latitudes; his book contained the cycles of the planets as derived from Hindu scholars, the members of an embassy from some part of Sindh, who called on the Khalif Almanṣūr, A.H. 154 (= A.D. 771). Alberuni charges him with having misunderstood the meaning of the word Āryabhata, which he is said to have used as meaning \( \gamma \beta \alpha \) of the measures of the great Siddhānta, i.e. the Brahma-
sidhdhānta of Brahmagupta. Lastly, Alfasārī (together with Ya'kūb) has used the word ḍāndi (padamāsa?) in the sense of adhamāsa (leap-month). On the whole, Alberuni finds that the tradition of Indian astronomy by Alfasārī is not very trustworthy, and that in it the names or termini technici are often corrupt and badly written.

As Alfasārī and Ya'kūb Ibn Ṭārīk are sometimes mentioned in the same context, there must have been a close relation between these two authors, the nature of which I have no means for examining. Have both learned from the same Hindu scholar, and have they independently of each other committed their information to writing? Or
has the one made a new edition or a commentary of the work of the other? Vide note to p. 169 (Ya'kūb).

P. 165. Śibi.—The word occurs thrice, and is written (siyā?) ; only in one place it seemed to be , but on repeated comparison of the MS. I find that originally here, too, was written . I do not know a measure of such a name. Perhaps it is the bisī, of which 16 = 1 pāntī (p. 166, l. 2 in Somanāth). Cf. Colebrooke, Essays,” i. 536; sixteen bisīs = one pāntī.

P. 166. Khudrīrizmān.—The comparison of the measures of this country, the modern Khīva, will remind the reader that it was the native country of the author.

P. 166. Varadhāmiḥīra.—I have not succeeded in finding this quotation in his Samhitā.


P. 167. 'Ajvān.—Alberuni only mentions the plural form, not the singular, which would be jūn or jaun, jōn. I take the word to be the Arabized form of yojana. The change from yojana to jōn was perhaps facilitated by a Prakrit pronunciation on the part of the Hindu teachers of Alfaṣārī, according to which a between two vowels may be dropped. Cf. gāo = gaja, raadam, rajata (Vararuci, ii. 2).


P. 169.—Ya'kūb Ibn Tārik seems to have been the most prominent predecessor of Alberuni in the field of astronomy, chronology, and mathematical geography on an Indian basis. He is frequently quoted in the Indica, much more than Alfaṣārī.

Here he gives the measures of the circumference and the diameter of the zodiacal sphere in yojanas, in which Alberuni recognises the system of Pulīsa. He speaks of a city, Tāra, within a sea in Yamakoṭī (i. 303). He gives the measures of the radius, diameter, and circumference of
the earth in *yojanas* (i. 312), a statement on the latitude of Ujain, and a quotation from the book *Arkand* on the same subject (i. 316). He mentions the four *mānas* or measures of time, *sauramāna*, *candrāmāna*, &c. (i. 353). His work contained tables of the revolutions of the planets, borrowed from a Hindu who had come in an embassy from Sindh to the court of the Khalif Almansūr, A.H. 154 (= A.D. 771), but Alberuni finds in these tables considerable deviations from those of the Hindus (ii. 15). He is accused of having misunderstood the word Āryabhaṭa, so as to take it not for the name of an author, but for a technical term meaning $\frac{1}{80}$ of the measures employed in the great Siddhānta (that of Brahmagupta), on ii. 18, 19. He called the leap-month ādhyanga (padamasa?) instead of *adhimāsa* (ii. 23). He gives an incorrect method for the computation of the solar days in the *ahargana* and for the reduction of years into days (by the side of a correct one) on ii. 26, 34, 38. He gives further details of the *ahargana* computation (ii. 44, 45), and a table indicating the distances of the planets from the earth, borrowed from a Hindu, A.H. 161 (= A.D. 777, 778), on ii. 67, 68.

Accordingly the work of Ya'kūb seems to have been a complete system of astronomy, chronology, and mathematical geography. It is called *Compositio Sphararum* and also *ēṣṭil*, i.e. *Canon*.

Alberuni sometimes criticises Ya'kūb, and maintains that he had committed errors, that he mis-spelled the Indian words, and that he simply borrowed the tables from his Hindu authority without examining them by calculation.

On his relation to Al-faṣārī, v. note to p. 165.

When Alberuni wrote his Chronology, he did not possess the work of Ya'kūb, for here he gives a note on the four *mānas* and on the word *padamasa* (padamasa?) on the authority of Ya'kūb, but taken from the work of another author. *Vide* my translation, p. 15.

As Ya'kūb studied in the years A.H. 154 and 161 (A.D. 771, 778), he must have lived in the second half of the eighth Christian century (probably in Babylonia). This is nearly all we know of him. Cf. Reinaud, *Mémoire sur l'Inde*, p. 313; Steinschneider, *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 24, 332, 354.

The *Fihrist*, p. 15, has a note on him in which there
is some confusion. The work *Compositio Sphærarum* is erroneously mentioned among the works of ‘Utârid Ibn Muḥammad, whilst it is apparently identical with the work here called *Canon*. It consisted of two parts, one on the sphere and one on the periods (the *yugus?*). According to Fihrist, he had written two more books, one on the division of the sine in *kardajat*, and another on what is derived from the arc of the meridian.

Regarding the embassy from Sindh, from which the Arabs are said to have got the first information on Indian astronomy, in fact, the two works of Brahmagupta, the *Brahmasiddhânta* (*Sindhind*) and the *Khaṇḍakâdhyaṇa* (called *Ardand*), I cannot find any historical account in the Arabic annals. We do not learn anything from Ibn Wâdih or Tâbarî of the presence of a Sindhî embassy in Babylonia in the year 154 (A.D. 771), as Alberuni has it, nor in the year 156 (A.D. 773), as Alhusain Ibn Muhammad Ibn Alâdâm maintains (Gildemeister, *Scripторum Arabum de rebus Indicis loci*, p. 101), nor of the presence of Hindu scholars in Babylonia in the year 161 (A.D. 777). This only is related by Ibn Wâdih, that when Abulabbâs Sařâh, the first Abasîde Khalîf, was dying in Anbâr, there arrived at his court an embassy from Sindh, A.H. 136 (A.D. 753). At all events, at the time of the Khalîf Almanṣûr, Sindh obeyed this prince, and Islam had spread not only in Sindh, but far beyond it into the adjacent countries, both by war and by commerce. There must have been many occasions for petty Hindu princes in Sindh to send special missions to the political centre of the Muslim realm.

When Ya’qûb wrote, the *Ardand* (*Khaṇḍakâdhyaṇa*) had already been translated into Arabic. By whom? By Alfasârî?

In the first fifty years of Abasîde rule there were two periods in which the Arabs learned from India, first under Mansûr (A.D. 753–774), chiefly astronomy, and secondly under Hârûn (786–808), by the special influence of the ministerial family Barmak, who till 803 ruled the Muslim world, specially medicine and astrology.

P. 170. *Socrates.*—I do not know the Greek form of this *dictum*. It must be observed that according to the common
tradition hides of animals were first prepared for vellum at Pergamum long after Socrates.


P. 172. As for the Greek alphabet, &c.—The source of this tradition on the origin of the Greek alphabet seems to be certain scholia to the Ars Grammatica of Dionysius Thrax: v. Immanuel Bekker, Anecdota Graeca, Berlin, 1816, vol. ii. p. 780 seq. The synchronistic notes point more to Joannes Malalas; perhaps these things were originally mentioned in the lacuna O 129.

Asidhas seems to be a mistake for Palamedes, Agenon for Agenor.


Bhaikshukā.—Alberuni writes Bāikshuka, probably that of the bhikṣu or beggar-monks, i.e. the śramana or Buddhist monks. Is the Audunpūr mentioned by Alberuni, identical with the famous Buddhistic monastery Udāndapuri in Magadhā (?) Cf. H. Kern, Der Buddhismus und seine Geschichte in Indien, German by H. Jacob, Leipzig, 1882, vol. ii. p. 545.

What Malvashau is I do not know (Malla-vishaya?).


Pp. 178, 179. This table has already been published by F. Wöpcke, Mémoire sur la Propagation des Chiffres Indiens, p. 103 seq.; A. C. Burnell, "Elements of South Indian Palæography," ii. ed., p. 77. Compare also F. Jaquet, Mode d'Expression Symbolique des Nombres Em-
ANNOTATIONS.


P. 181. Pushandhīla.—The eunuch is called shandha. This seems to be a diminutive form compounded with the word punaś (G. Bühler).

P. 182. They magnify the nouns of their language, &c.—This somewhat enigmatic sentence seems to have the following meaning:—An Arabic word, e.g. karrsh (a sea-animal), is magnified, i.e. receives a larger form, by being changed into the diminutive form, i.e. kuraish (a small sea-animal, as a proper noun, the name of the tribe to which Muhammad belonged). The diminutive form serves the purpose of magnifying the form of the word: cf. Kashshåf to Koran, 106, 2, (not the explanation). If the Hindus magnify their nouns by giving them the feminine gender, this must be referred to some of the pisonastic suffixes, e.g. d, t, which are added to Indian nouns without altering their meaning. In appearance they are the terminations of the feminine gender, in reality euphonic changes of the more ancient suffixes aca and ika, e.g. patå, board, by the side of pat. Cf. Hörnle, "Comparative Grammar of the Gaudian Languages," § 194 seq.

P. 183.—An explanation of the Indian chess has been published by A. Van der Linde, Geschichte und Litteratur des Schachspiels.


P. 189. Vyādī.—A lexicographer of this name is mentioned in a certain connection with Vikramādityā by Colebrooke, "Essays," ii. 19.

P. 190. Raktāmala = rakta = red, and amala = emblica officinalis. I do not see how the word could be understood to mean oil and human blood.

P. 191. Bhojadēva.—Cf. on this king of Mālava, Lassen, Indische Alterthumskunde, iii. p. 845 seq.

P. 196. For it is not navigable.—This passage agrees almost literally with Plato’s *Timæus*, 25 D:—

διὸ καὶ νῦν ἄπορον καὶ ἀδιερεύνητον γέγονε τὸ ἐκεῖ πέλαγος, πηλοῦ κάρτα βραχέος ἐμποδῶν ὄντος ἐν ἡ νῆσος ἰαμείνε παρέσχετο.

P. 197. The various tribes of the Zanj.—The traditions of the Arabs regarding Eastern Africa have been collected by Marcel Devic in his *Le Pays des Zendjas*, Paris, 1883.

P. 197. The configuration of the northern coast of the Indian Ocean seems to have been a favourite subject of Alberuni, for he mentions it again on p. 270.

P. 199. Mähura, so written by Alberuni, is written श्री, Mahura, by his elder contemporary Al-‘utbi, more in keeping with the Sanskrit vowels (Mithūr). Alberuni reckons the distances in farsakh, regarding the measure of which he unfortunately does not give accurate information. According to i. 167, 1 yojana = 32,000 yards = 8 miles; 1 mile = 4000 yards; and according to i. 200, 1 farsakh = 4 miles = 1 kuroh; 1 farsakh = 16,000 yards. Cf. also Aloys Sprenger, *Die Post- und Reiserouten des Orients*, Vorrede, p. xxvi., who proves that one Arabian mile = *propter propter* 2000 metres = 2186 yards, whilst the English geographical mile = 2025 yards. If we, therefore, want to compare Alberuni’s distances with English miles, we must reckon—

1 English mile = \(\frac{5400}{3200}\) Arabian mile.
1 Arabian mile = \(\frac{4000}{2186}\) English mile.
1 farsakh = 4 Arabian miles = \(\frac{3200}{2025}\) English miles.

P. 200. Alberuni gives sixteen itineraries which seem to have been communicated to him by the military and civil officers of King Mahunud (on some of these roads he
had marched with large armies, *e.g.* to Kanoj and to Somanâtha), from merchants and sailors, from Hindu and Muslim travellers. The starting-points of these itineraries are Kanoj, Mâhûra (now Muttra), Anhilvâra (now Pattan), Dhâr in Mâlavâ, and two less known places, Bâri, the temporary capital of the realm of Kanoj, after the old capital had been taken by the Muslims, and a place called Bazâna.

These itineraries are—1. From Kanoj to Allahabad, and thence towards the eastern coast of India as far as Kâñci (Conjeveram), and farther south. 2. From Kanoj (or Bâri) to Benares, and thence to the mouth of the Ganges. 3. From Kanoj eastward as far as Kamroop, and northward to Nepal and the Tibetan frontier. 4. From Kanoj southward as far as Banavâsi on the southern coast. 5. From Kanoj to Bazâna or Nârâyân, the then capital of Guzarât. 6. From Muttra to Dhâr, the capital of Mâlavâ. 7. From Bazâna to Dhâr and Ujain. 8. From Dhâr in Mâlavâ towards the Godâvari. 9. From Dhâr to Tâna, on the coast of the Indian Ocean. 10. From Bazâna to Somanâtha, on the south coast of Kathiavar. 11. From Anhilvâra to Tâna, on the west coast, north of Bombay. 12. From Bazâna *vid* Bhâti to Loharâni, at the mouth of the Sindh river. 13. From Kanoj to Kashmir. 14. From Kanoj to Pânipat, Attok, Kâbul, Ghazna. 15. From Babrahân to Addishtân, the capital of Kashmir. 16. From Tiz, in Makrân, along the coast as far as Setubandha, opposite Ceylon.

*Cf.* the following latitudes and longitudes, taken from the *Canon Musudicus*:

Tree of Prayâga, 25° o' lat., 106° 20' long.; Kurnâla, 26° 1' lat., 106° 40' long.; Tîmarî, 23° o' lat., 106° 30' long.; Kajûrâhâna, 24° 4' lat., 106° 50' long.; Bazâna (?) or Nârâyân, 24° 35' lat., 106° 10' long.; the country Kannakura, 22° 20' lat., 107° o' long.; Shârvâr, 24° 15' lat., 107° 50' long.; Pâtalîputrâ, 22° 30' lat., 108° 20' long.; Mungîrî, 22° o' lat., 109° 10' long.; Dâgum, 22° 40' lat., 110° 50' long.; Bâri, 26° 30' lat., 105° 50' long.; Dâlali, 25° 40' lat., 102° 10' long.; Dhamnâla, 31° 10' lat., 100° 55' long.; Shîrshârâha, 38° 50' lat., 102° 10' long.; Bhilâsanâla, 23° 50' lat., 87° 45' long.; Bambhanâ, 26° 40' lat., 85° o' long.; Loharâni, 24° 40' lat., 84° 25' long.; Dâilâl, 24° 10' lat., 82° 30' long.; Bhâtiyâ, 28° 40' lat., 96° o' long.; Ujain, 24° o' lat., 100° 50' long.; Tiz, 26° 15' lat., 83° o' long.; Kandî, 33° 40' lat., 95° 50' long.; Dûnpûr, 33° 45' lat., 96° 25' long.; Tanjore (?), 15° o' lat., 115° o' long.; Rameshâr, 13° o' lat., 118° o' long.; Jahârâvar, 39° 50' lat., 96° 15' long.; Kâñci, 31° 1' lat., 95° 55' long. Longitude is reckoned from the coast of the Atlantic; that of Bagdad is 70°.
P. 200. Barhamshil = Brāhmanabāila = Brahmin's rock (?).

Tree of Prayāga = Allahabad, at the confluence of Ganges and Jamna.

In line 20 after 12 farsakh (in the Arabic only 12 without farsakh) there is apparently a lacuna.

Uvārayahr.—One expects an indication of Orissa (Urlyādesa). The word might also be read Urīyahr. Is Urīyadrūt meant? Urdabtshau perhaps = urdhva-vishaya.

Jaur's possessions, i.e. the Cola empire; v. also here, i. 209, and Lassen, Indische Alterthumskunde, ii. 435, iv. 230 seq.

P. 200. Bārt.—Regarding the situation of this place the following statements must be taken into account:—It was situated ten farsakh or three to four days' march distant from Kanoj towards the east, east of the Ganges, in the neighbourhood of the confluence of the rivers Kānori and Sarayu. It was twenty-five farsakh distant from Oudh. The name Bārt occurs also in Elliot-Beames, "Memoirs," ii. 83, as that of a subdivision of the district Agra.

P. 201. Kāmrd is apparently Kāmardāpa and Tilvat = Tirhoot. The latter is by mistake also written Tanvat. Are we to read Tīrdt? The word is perhaps composed of Tārd, the name of the nation who lived there, and a word like bhākti.

The empire of Shilahat.—Is this to be identified with Sylhet, the province of Assam?

Bhotesvar seems to be bhauṭṭa-tvāra, lord of the bhauṭtas, or Tibetans.

P. 202. Kajūrāta is = kharjūra-bhāga.

Tiauts.—According to a well-known rule of Prakrit (Vararuci, ii. 2), the name Tiautsopa (Ptolemy, vii. i. 63) would become something like Tiaurī. As there is a lacuna in the Arabic manuscript, the situation of this place cannot be accurately defined.

Kannakara.—This is probably identical with Kamkar, the realm of the Balharū, according to Mas'ūdī: v. Elliot, "History of India," i. 25.
P. 202. Bāzdāna.—The reading is conjectural. For an identification v. Archæological Survey of India, ii. 242. For Shāhānī (Shāhānīyā) v. ibid. ii. 399.


Jaddāra.—This reading is uncertain. Perhaps all the signs of the Arabic text (الرضمة) are the name of a place.

P. 202. Bāmhār is perhaps identical with Ptolemy’s Bāmyūropu (Pf. vii. i. § 63), as in some cases an h represents an elder g; e.g. Candraha = Candrabhāgā, devahar = devagriha, kulahara (Prakrit) = kulagriha.

P. 203. Namāvur, Alispar.—Are these names to be identified with Nimār and Ellichpur in Central India? Cf. G. Smith, "Geography of British India," pp. 339, 347.


Lārdesh = Ārūṣ of Ptolemy, vii. i. 4.

Bihroj = Broach = Bāviraṭa, G. Smith, p. 263.

Rihanjār is probably identical with Ágrīwóyara (Ptolemy, vii. i. § 63). Two consonants frequently undergo a metathesis, if one of them is a liquid. Agrinagara has become Arginagara, and the g is here represented by an h, as in Candarāha = Candrabhāgā.

Lohārānt seems to be identical with Lōwārāpe of Ptolemy, vii. i. § 2. A metathesis of the middle consonants has taken place, and b has become h. It is also called Lohānīyā (i. 316).

P. 205.—Jīlandhar is the Kuvāmpur of Ptolemy, vii. i. § 42, G. Smith, p. 207.


Is it identical with modern Phillaur? G. Smith, p. 208.
P. 206.— *Kvthk = Kapisthala = Καμπισθάλα (Megan-
thenes), now Kapoorthala, G. Smith, p. 208. Vide also
Kvthk in Elliot’s “History of India,” ii. 337, 353.
Mandahakika. Cf. Elliot, l. c. i. 530.

P. 206. *Kumart.—I am inclined to identify this river
with the *Kunhar (G. Smith, p. 231). Is the Mahvi=
Kishen-Ganga?

P. 207.— *Skhr is explained by Cunningham, l. c. p. 99,
as Hushkapura, Huvishkapura and Barāmula as Vardha-
mula.

P. 208.— *Tākas or is perhaps to be explained as *Tak-
katkavara, like Bhoteshar = Bhautta-lēvara. Cf. on *Tāka,
Cunningham, l. c. p. 749.
Rājaśrt seems to be identical with Rajaori (G. Smith,
p. 228).

P. 208. *Tiz. The coast of India begins with *Tiz.—Cf. with
this route along the coast that one given by Ibn Khurdādbih
in Elliot, “History of India,” i. 15, 16; A. Sprenger, Die
Post- und Reiserouten des Orients, pp. 80-82.
Munha = Skr. mukha, Prakrit muham, Hindī muh : v.
Daibal.—On the identification with Karaci v. Elliot,
“History of India,” i. 375. Daibal-Sindh is the *Dīlcfi
do Duarte Barbosa, translated by Stanley, p. 49 (Hakluyt
Society).

Pp. 208, 209.—Barot = Baroda, Kambayat = Kambay,
Bihrog = Broach. Sūbāra is identical with Skr. *Śūrpāraka, Ptolemy’s Σωπάρακα, and the Sufīda of the Arabs.
Tāna = Skr. sthāna, and Sandān is perhaps = saunadhāna.
of Sopara,” &c., “Journal” of the Bombay branch, 1881,

P. 209.— *Panjayāva seems to be a mistake for some
older form of the name Tanjore.
Rāmēsh = Rāmēsvara?—On Rāma and the monkeys of
the Kishkindha mountains cf. the fourth book of the
Rāmāyana.
P. 210.—The theory of the rising and disappearing of the Diva islands seems to have been a favourite one of the author's, for he explains it in three different places; v. p. 233, and ii. 106.

P. 211.—Shauhat is explained by Johnson as a tree whence bows are made, and mulamma' means having different colours. What particular sort of wood this means I do not know.

P. 211.—Indravedi must be changed into Antarvedi, "the old name of the Lower Doab, extending from about Etawah to Allahabad." Elliot-Beames, "Memoirs," ii. 10; Elliot, "History of India," ii. 124.
Is Bhatal identical with Ptolemy's Παραληπτή?

P. 213. We have already mentioned, viz. on p. 17.

P. 214. ὥραι καιρικαί, i.e. the ancient division of day and night, each in twelve equal parts, of whatsoever length day and night happened to be. These hours were different in the different seasons of the year. On the contrary, the ὄρατος ἑσπερικός, probably of scientific origin, are the twenty-fourth part of a nychthemeron, always equal throughout the course of the whole year. Cf. Ideler, Handbuch der Chronologie, i. 86.

P. 214. Hord.—The Persian nimbhra means half part, and in astrology one-half or fifteen degrees of a sign of the zodiac; v. ii. 222.

P. 214, l. 30.—The distance between the sun and the degree of the ascendants divided by fifteen gives in hours the time which has passed since sunrise; the dominus of the day being at once the dominus of the first hour, the rule here given is evidently correct (Schram).

The reader will notice the Greek names ἡλιός, ἀρα
VOL. II. X
"Aρης, ήμνα" Ερμῆς, ιένα Ζεῦς, ἀρχαίοτά Αφροδίτη, κονά Κρόνος.


P. 217. Table.—I shall here give the names of the months as the author probably pronounced them, but cannot be held responsible for the details of the vowel-pronunciation: cetr, ἔβιβάκ, jert, ἄσχαρ, shrāvan, bhadro, ἄσβες, kārtik, manghir, posh, mad, pāgun. Perhaps most of these names terminated in short u, as manghiru. Cf. the Hindustani names in Dowson’s “Grammar of the Urdu,” 1887, p. 259.

The vernacular names of the suns are perhaps to be pronounced: rabi, bishnu, dhata, bidhata, arjamu, bhagu, sabita, pāsha, tvasha, arku, dībākaru, anshu.

The difference between vernacular and classical speech is repeatedly referred to. Vide i. 18 (v. note), 218.

P. 218. With the tradition of the Vishnudharma.—After these words must be added the following, which I have overlooked in translating: “And further he (i.e. Vāsudeva) has spoken in the Gītā, ‘I am like the vasantas, i.e. the equinox, among the six parts of the year.’ This too proves that the tradition as given in the first table is correct.” Cf. Bhagavad-Gītā, x. 35.

P. 218.—Compare the table of the nakshatras with E. Burgess, Sūrya Siddhānta, p. 468.

P. 219.—Vardhamihira.—Vide note to p. 54.

P. 220.—The Greek names kriya krīs, tāmbiru ταῦρος, jituva διήνυμος, pārtina παρθένος, &c., are declared to be not generally known. Cf. A. Weber, Indische Studien, ii. 259. Instead of jitu read cetthu.

P. 222. Galenus.—I have not been able to verify this quotation about Asclepius in the Greek works of Galenus.

P. 223. From the belief of the nations who lived in ancient times in and round Babel, &c.—That information
to which the author here refers was probably derived from the books of the Manichæans.

P. 223. Plato.—This quotation is not identical with Timæus 36 b–d, but apparently derived therefrom. It runs:—

ταύτην οὖν τὴν ξύστασιν πᾶσαν διπλῆν κατὰ μέσον σχίσας μέσην πρὸς μέσην, κ.τ.λ. τὴν δ’ ἐντὸς σχίσας ἐξαχεῖ ἐπτὰ κύκλων ἀνίσους, κ.τ.λ.

 Cf. note to p. 35.


P. 225. Vasishtha, Aryabhata.—The author does not take the theories of these men from their own works; he only knew them by the quotations in the works of Brahmagupta. He himself states so expressly with regard to Aryabhata. Cf. note to p. 156, and the author, i. 370.

P. 225, 227. Balabhadra.—Vide note to p. 156.


P. 226. Ptolemy.—Cf. the edition of Halma, Paris, 1813, tome i. p. 2:

τὸ μὲν τῆς τῶν ἀλλών πρῶτης κινήσεως πρῶτον αὐτοῦ, εἰ τε κατὰ τὸ ἀπλοῦν ἐκλαμβάνω, θαν ἀόρατον καὶ ἀκίνητον ἄν ἴγισκάτο, καὶ τὸ τούτου ἴσητέν ς ἐδώς θεωρεῖν τοῦ περί τα ὑπωρόται του κύσμου τῆς τοιαύτης ἐνεργείας νοθείσης ἄν μόνον, καὶ καθάπαξ κεχωρισμένης τῶν ἁπαθῶν ουσίων.

I. 226. Johannes Grammaticus.—Vide note to p. 36. I have not been able to find this quotation in the Greek text.

Pp. 228, 229.—The author repeatedly complains of the great verbosity of the Sanskrit caused by the necessities of the authors, who will only write in metre, and require
a great number of synonyms, in order that one word may fit into the metre if others will not. *Cf. i. 215, 217, 299.*

P. 229. *For those men who, &c.*—This is the only passage in which Alberuni clearly speaks of his Pandits. Apparently he tried hard to learn Sanskrit, but could not succeed on account of the difficulties of which he himself complains, and he studied Indian literature in the same manner as the first English scholars in Bengal, by the help of native Pandits.

P. 230. Table.—*Cf. Vishnu-Purāṇa, ii. 209,* where the fifth and seventh earths are called mahātala and pātāla.

Also the Vāyu-Purāṇa (ed. Rajendralāla Mitra, Calcutta, 1880) offers somewhat different names, viz. atalam, sutalām, vitalām, gadhastalam, mahātalam, śṛṭitālam, pātālam, and krishna-bhaumam, pāṇḍu, raktam, pīta, saṅkara, śilā-mayam, sauvanā (vol. i. p. 391, v. 11–14).

P. 231. The spiritual beings, &c.—This list of names is literally taken from Vāyu-Purāṇa, vol. i. p. 391, v. 15–394, v. 43 (Adhyāya, 50).

P. 231. Johannes Grammaticus.—I have not been able to find this quotation in the Greek text, nor the verse of Homer. *Vide* note to p. 36.

P. 231. Plato.—*Cf. Timæus, 41A:—*

Θεοὶ θεῶν ὡν ἐγώ δημιουργός πατήρ τε ζῷων, ὡς ἔµοι γενόμενα ἄλυτα ἐµοῦ ὑ’ ἐθέλοντος· τὸ μὲν οὖν ὅθεν δέ ἐθέλει πᾶν λυτόν, τὸ γε μὴν καλὸς ἐρμοσθὲν καὶ ἔχων εὐ λύειν ἐθέλειν κακοῦ.


P. 232. The commentator of the book of Patañjali.—*Cf. note to p. 27.*

P. 233. Dībajāt.—This remark was already made on p. 210.

P. 236. Lokâloka, which means a *not-gathering place*. Apparently the author had not quite understood the nature of the compound loka-aloka, i.e. *world* and *not-world*.

P. 237. *Vishnû-Purâna*.—The first quotation seems to correspond to ii. 211–213, the second to ii. 204, and the third (on p. 238) to ii. 225–227. Śesâkhya is apparently a mistake for Śesha-âkhyâ, i.e. having the name of Śesha.

P. 240.—The story of Visvâmîtra’s attempt at creating a second world is taken from *Râmâyana*, i. chaps. lvii.–lx.; but here the king is called Trîsanâkû.

P. 240.—On Śrîpâla, *v. note* to p. 164. The city of Multân is in various places mentioned by the author in such a remarkable manner as makes me think that he knew it, and that he had lived there for some time. When King Mahmûd, A.H. 408 (A.D. 1017), had returned from Khwârizm-Khîva after the conquest of the country, and had carried along with him the princes of the conquered house of Ma’mûn, many scholars (among them Alberuni), officers, and soldiers, did he send some of these (among them Alberuni) as state prisoners to Multân, which he had conquered years before? In this way, nineteen years later (A.H. 427), the princes of the family of Altuntash, who had ruled Khwârizm after the Ma’mûnis, were treated by Mahmûd’s grandson, Majdûd, who sent them as state prisoners to Lahore. At all events, it is perfectly certain that Alberuni cannot have been in favour with King Mahmûd, or he would have dedicated one of his books to him. *Cf.* Sachau, *Zur ältesten Geschichte und Chronologie von Khwârizm*, i. pp. 16, 28.

P. 240.—*Aljâihânt* is one of the fathers of Muslim literature on geography and travels in the eastern part of the Khaliphate, minister of one of the Sâmânt kings of Central Asia towards the end of the ninth Christian century. His work is most extensively quoted, but has not yet come to


P. 242. 1020 to 1030 stars.—This is the number of stars enumerated in the star-catalogue of 'Abdurrāhām Sāfī (cf. Schjellerup, *Description des Étoiles fixes par Alīsafī*, St. Petersburg, 1874), which Alberuni has transferred into his *Canon Masudicus*.

Should those men breathe and receive, &c.—I am not quite certain whether I have found out the right meaning of these words or not.

P. 243. *The commentator Balabhadra, &c.*—Vide note to p. 156.

P. 245, l. 10.—The values here given correspond to the greatest declination of 24°. So $\sin A = 1397'$ is the sine of 24°, $\sin B = 298'$ the versed sine of 24°, and $\sin C$ the difference between this latter and the radius 3438' (*Schram*).

P. 245, l. 12. *Kardajāt.*—The word *kardaja* seems to be derived from the Persian *karda* = cut, meaning a segment. The radius is equal to 3438 minutes of the periphery, which are called *kardajāt*. Cf. i. 275, and ii. 205.

P. 246, l.—Read 24° instead of 23°.

P. 246. *Āryabhaṭa of Kusumapura* is repeatedly quoted by Alberuni. He mentions the orders of the numbers from *ayuta* to *parapadma*, i. 176. Here he speaks of the height of Mount Meru, on the longitude of Kurukshetra, i. 316 (where he quotes Pulisa and Prithusvāmin), on the day of the Devas and that of the Pitaras, i. 330. He calls the *cakrā kincā* i. 335. From a book of this it is quoted that 1008 *caturyugas* are one day of Brahman; half of it is *utsarpinā*, the other half *avasarpinā* (Jaina terms), i. 371. Unfortunately I cannot read the title of this book; the signs may be निपुन, and it must remain uncertain whether it is an Arabic word with the article or an Indian one.
Alberuni warns the reader not to confound this Aryabhaṭa with the elder scholar of this name, to whose followers he belongs. In this place (i. 246) Alberuni does not seem to have used a work of Aryabhaṭa junior himself, but to have taken these words of his from a commentary of Balabhadra. We learn here that the book had been translated into Arabic, but do not learn which particular work of Balabhadra’s. Was it his commentary on the Khandakhādyaka of Brahmagupta? Vide note to p. 156. That Alberuni had made a new edition of the Arabic version of the Khandakhādyaka is known (v. edition of the Arabic original, pref. p. xx.); perhaps he had also procured himself an Arabic translation of Balabhadra’s commentary. Cf. on this younger Aryabhaṭa, Kern, Brhat Saṁhitā, preface, pp. 59, 60, and Dr. Bhāu Dāji, “Brief Notes on the Age and Authenticity of the Works of Aryabhaṭa, Varāhamihira,” &c., p. 392. Alberuni always calls him Aryabhaṭa of Kusumapura (Patna), to distinguish him from his elder namesake.

P. 247. Śuktibām.—This seems to be some vernacular form for Śuktimat. Vishnu-Purāṇa, ii. 127. Rikshabām = Rikshavat (?).

P. 248. The Vishnu-Purāṇa says.—I do not find this quotation in the Vishnu-Purāṇa. Cf. V. P. ii. 117.

P. 248. The commentator of the book of Patañjali.—Vide note to p. 27.

P. 249. Alsrānshahrt.—Vide note to pp. 6, 7.

P. 249. Ardiyā and Girmagar (?) are apparently the same mountains which the Avesta calls hara bereawhit and taera.

P. 254. Vishnu-Purāṇa.—The quotations from the V. P. given in this chapter are found in ii. p. 191 seq.

P. 254.—Jānu, as here the river Yamunā is called, corresponds to the Prakrit form prescribed by Vararuci ii. 3, viz. Jauña.

P. 257. Vāyu-Purāṇa.—The names of the rivers are
found in the 45th Adhyāya, vol. i. pp. 349–350. The order of enumeration of the mountains in the Sanskrit text is this: Pāriyātra, Riksha, Vindhya, Sahya, Malaya, Mahendra, Sūkti.

V. 97.
vedasmritir vedavatī vṛtrahīṃ śindhu eva ca
varṇāśa candanā caiva satrā mahatī tathā.

V. 98.
parā carammanvati caiva vidyāśa vetravaty api
sīpṛā hy avanti ca tathā pāriyātraśrayaḥ smṛtāḥ.

V. 99.
sūgō mahānadaś caiva narmmadaśa sumahādrumā
mandākini dasārpa ca citraktuṭā tathaiva ca.

V. 100.
tamasā pipyalā śroṇi karatoya pīcācikā
tiltpalā vipāśa ca baṇjulā bālupāhini.

V. 101.
siterajā sukhtimati makrumā tridivā kramat
rīkshaśadat prasūtās tā nadyo maṇinibhodakāḥ.

V. 102.
tāpīt payoshā nirbhandhyā madṛā ca nishadhā nādī
evānā vaṭarāpi caiva śitivāhuḥ kumudvati.

V. 103.
toyā caiva mahāgaurī durgā ca 'ntaḥśilā tathā
vīndhyapādaprasmūtās ca nadyāḥ pūnyajalāḥ śubhāḥ.

V. 104.
godāvari bhimarathi kṛishṇā vāiny atha vaṇjulā
tungabhadrā sprayogā kāuverī ca tathā, pagā
dakshiṇāpathanadyas tu sahyapaḍād viniḥṣritāḥ.

V. 105.
kṛitamālā tāmrarvarṇā pushpajāty utpalavatś
malayābhijātās tā nadyāḥ sarvāḥ sitajalāḥ śubhāḥ.
V. 106.
trisámā ṛitukālyā ca ikahulā tridivā ca yā
lāṅgūlīni varūṣādharā mahendratanayāh smṛitāḥ.

V. 107.
ṛishikā sukumārī ca mandagā mandavāhīnī
kūpā palāśīni caiva ṛuktimatprabhavāḥ smṛitāḥ.

P. 259.—Very similar to this enumeration of rivers is
that in the Vāyu-Purāṇa, adhyāya 45, vv. 94–108:—

V. 94.
ptyeante yair imā nadyo gaṅgā sindhusarasvatī
satadruś candraṃabhagā ca yamunā sarayūs tathā.

V. 95.
irāvatī vitastā ca vipāsā devikā kuḥā
gomati dhutapāpā ca bāhūdā ca drishadvatī.

V. 96.
kauśikī ca tritīyā tu niścīrā gaṅdaki tathā
ikahulā lohitā ityeta himavatpādaniḥsmṛitāḥ.

The following verse, already given in the note to p. 273,
mentions the rivers flowing from the Pāriyātra.

P. 259. Vedasīnt.—Write Vedasīnt.

P. 259. Kāyabish.—The realm of Kāyabish is here
identified with Kābul. The signs may be read Kāyabish
or Kāyabisk; only the consonants are certain. This
reminds one forcibly of the name of the Indo-Scythian king
Kadaphes. A dental sound between two vowels may in
later forms be represented by a y, as e.g. in Briyantus =
Vitastā. Or is the word to be combined with l'anini's
Kāpisht (Capissene in Pliny)? Cf. Paṇini and the geo-
graphy of Afghanistan and the Panjāb in “Indian Anti-
quary,” 1872, p. 21.

P. 259. Ghūzak.—This pass (‘akaba in Arabic) is also
mentioned in Elliot, “History of India,” ii. 20, 449
(Gḥūrak).
P. 259. Below the town of Parvân.—It is mentioned in the maps at about the distance of eight miles, as the crow flies, north of Tschârikar. The road from Anderâb to Parvân has been sketched by Sprenger, *Post- und Reise- rönten*, map nr. 5.


P. 260.—Bhâtul seems to mean a sub-Himalayan country between the Beas and the Satlej. It occurs only here and p. 211 (together with Antarvedi). Masudi (Elliot, *History of India*, i. 22) mentions it as the name of one of the five rivers of Panjáb.

The union of the seven rivers.—This tradition apparently refers to the *hapta hemudu* of the Avastâ, Vendidad i. 73.

P. 261. Matsya-Purâṇa.—Not having this book at hand, I give the corresponding passage from the Vâyu-Purâṇa, adhyâya 47, vv. 38–58:—

V. 38.

nadyâh śrotas tu gâṅgâyâḥ pratyapadyata saptadhâ
nalinî hrâdini caiva pâvanî caiva prâggata.

V. 39.

sitâ cakshuḥ ca sindhuḥ ca prâtâm diâm âśrîtâh
saptamî tv anugâ tâsâm dakšîñena bhagrâthâ, &c.

V. 42.

upagacchanti tâh sarvâ yato varshâti vâsavaḥ
sirindhûn kuntalâns cinân varvarân yavasân drahûn.

V. 43.

rushânahâ ca kuñindâmsca anâgalokavarâmâ ca ye
krito śvâ dvidhâ sindhumarum sitâ ’gat paścimodâhitih.

V. 44.

atha cinamarâmâ caiva nangânân sarvâmâlikân
sâdhârânâm tushârâmâms tampâkân pahlavan daradân sakân
etân janapadân cakshuḥ strâvayanti gato ’dadhim.
V. 45.
daradāmē ca sakāśmirān gāndhārān varṣapān hradān śivapaurān indraḥāsān vadātinā ca visarjayān.

V. 46.
saṁdhavan randhракarakān bhramarābhūrāhakān śunāmukhāms cordhvamanun siddhacāraṇasevitān.

V. 47.
gāndhavān kinnarān yakṣān rakshovidyādhharorangān kalāpagramakāmē caiva pāradān sīgānān khasān.

V. 48.
kirātānā ca pulindānā ca kurun sabharatān api paṃcālakāśimātīyānā ca magadhāṃgāms tathaiva ca.

V. 49.
brāhmaṁcāmē ca vaṅgamāca tāmalipāmās tathaiva ca etān janapadān āryān gaṅgā bhāvayate subhān.

V. 50.
tataḥ pratihātā vindhye pravishtā dakshinodadhim tataś ca 'hādini punyā prācīnābhīmukhi yayaun.

V. 51.
plāvayanti upaḥbhogāmē ca nishādānān ca jātayaḥ ghīvarān ēṣhkāmē caiva tathā nilamukhān api.

V. 52.
keralān ushṭrakarnāmē ca kirātān api caiva hi kālodarān vivarṇāmē ca kumārān svarnabhūshitān.

V. 53.
sa manḍale samudrasya tirobhūtā 'nuṇūrvataḥ tatas tu pāvan caiva prācitā eva dīsaḥ gatā.

V. 54.
apathān bhāvayanti 'ha indradyunmamaro pi ca tathā kharapathāmē caiva indrāsaṅkupathān api.
V. 55.
madhyen 'dyānamskaraṁ kuthapraṇavaṁ yayaṁ
indravipaśamudre tu pravishtā lavoṣadhim.

V. 56.
tataś ca nalinti cā 'gāt prācimāsāṁ javena tu
 tomaran bhavayanti ha hamsamārgan sahuḥukān.

V. 57.
pūrvān desāṁ ca sevanti bhīttvā sa bahudhā girin
karṇapraṇavaṁ caiva prāpya cā 'vamukhān api.

V. 58.
sikatāparvatamaran gatvā vidyādharan yayaṁ
nemimaṇḍalakosṭhe tu pravishtā sa mahodadhim.

P. 262. Vishnu-Purāṇa.—This quotation occurs V. P.
ii. 192. Instead of Anutapata, Shikhi, and Karma, read
Anutaptā, Śikhi, and Kramu.

P. 263. Created.—This word seems to prove that Alber-
uni already adhered to the dogma of orthodox Islam, that
the Koran had been created by God from all eternity, and
had been preserved on a table in heaven before God
revealed it to mankind by the mouth of his prophet,
Muḥammad.

P. 264. Ibn Almukaffa ('Abdallāh) and 'Abdalkarim
are also mentioned in the author's "Chronology of Ancient
Nations," pp. 80 and 103.

P. 265. For this the astronomers require them, &c.—When
writing these criticisms, the author probably thought of
Brahmagupta. Cf. the chapter on eclipses, ii. 110 seq.

P. 267. Yamakoṭi, Lāṅkā, &c.—Cf. the same names in
Sūrya-Siddhānta, xii. 38–40.

P. 268. Āryabhaṭa, Vaśisṭha, Lāṭa.—All the astro-
nomers quoted in this context were not known to the author
from their own works, but only through quotations in the
works of Brahmagupta. Also the words of Varāhamihira
(here and p. 272) seem to be quotations of Brahmagupta (evidently p. 276), although they possibly might have been taken from Varahamihira’s *Pañcasiddhāntikā*. Pulisa, of course, must be excepted, as his *Siddhānta* was in the hands of Alberuni, and in course of being translated by him.

P. 271. *Amardvatī, Vaivasvata, &c.* — Cf. on these four cities *Vishnu-Purāṇa*, ii. 240.

P. 273. *Apta-purāṇa-kāra.* — I do not see how the Arabic signs must be read. The translation of the term means *the true ones who follow the Purāṇa*.

P. 274, l. 37.—TA being the sine of $3^9_8$ is equal to 225', its square to 50,625; TB the versed sine of $3^9_8$ is 7', and $\text{HT} = \text{radius} - \text{TB} = 3438' - 7 = 3431$ (Schram).

P. 275, l. 3.—The following calculation seems to have been made very negligently, for there are several faults in it. The radius $795^9_27^1_6$ is correctly determined, for employing the ratio 7 : 22 between diameter and circumference, we are indeed led to this number. But already in the determination of BC there is a fault. Alberuni seems to have converted $0^9_7 42''$ into yojanas, instead of converting $0^9_7 45''$; for $360^0$ being equivalent to 5000 yojanas, we get for $1^0_1 13$ yojana, 7 krośa, 444$\frac{1}{9}$ yards, for $1^0_1$ krośa, 3407$\frac{1}{3}$ yards, and for $1'' 123_3\frac{1}{3}$ yards, and reckoning with those numbers we get $0^0_7 42''$, and not $0^0_7 45''$, which corresponds to 57,035 yards. Further, the rule he makes use of is completely erroneous; it is not true that the relation between the height of two observers is the same as the relation between the sines of their respective fields of vision. If this were the case, we should have $\sec a - 1 : \sin a = \sec \beta - 1 : \sin \beta$, or the quotient $\frac{\sec a - 1}{\sin a}$ would be a constant for every value of $a$, which, of course, is not the case. But even with his incorrect rule we cannot find the numbers he has found. This rule is 4 yards: sine of field of vision = 57,035 yards: 225', so one would have sine of field of vision = $4 \times 225' = 57035'$; but he finds
the sine of the field of vision equal to $0^\circ 0' 1'' 3'''$, which corresponds to $\frac{1000'}{57035}$, and not to $\frac{900'}{57035}$. Therefore Alberuni seems to have reckoned $4 \times 225 = 1000$ instead of 900. Also the length of each degree is not quite correct; it is not 13 yojana, 7 krośa, $333\frac{1}{3}$ yards, but, as above stated, 13 yojana, 7 krośa, $444\frac{2}{3}$ yards. Lastly, if we convert by means of this number $0^\circ 0' 1'' 3'''$ into yards, we find $129\frac{1}{2}$ yards, so that the $291\frac{1}{2}$ yards he speaks of seem to have been arrived at by an erroneous metathesis of the original ciphers (Schram).

P. 277. Prāṇa.—Cf. on this measure of time here i. 334. 335.

P. 278. The inhabitants of Mount Meru, &c., till as a westward motion, almost identical with Sūrya-Siddhānta, xii. 55.

P. 281. There is a story of an ancient Greek, &c.—Probably taken from Porphyry’s book on the opinions of the most prominent philosophers about the nature of the sphere. Vide note to p. 43.

P. 289. The Greeks determined, &c.—The author has given a description of the winds, according to the Arabian and Persian views, in his “Chronology of Ancient Nations,” pp. 340, 341.

P. 291. Atri, Daksha, &c.—The legends here referred to are found in Viṣṇu-Purāṇa, i. 153, ii. 21 seq.

P. 294.—The Rishi Bhuvana-kosa (i.e. globe) is only mentioned in this place, and not known to me from other sources. His work, the title of which is not given, seems to have treated of geography.

P. 295. Samnāra (?).—Thus the manuscript seems to have it. The signs may also be read Samnād.

P. 297. Kārmacakra.—Vide on this term a note of H. Kern, Brīhat Samhitā, translation, to the title (kārmacakra) of chap. xiv.
P. 298. *Utpala, a native of Kashmir.—Vide note to p. 157.*

P. 298.—Stone-tower, i.e. the Αἰθων πύργος of Ptolemy, vi. 13, 2.

P. 299.—Bushang, a place near Herat, to the west. Sakilkand, also Iskilkand, is identified with Alexandria by Elliot, "History of India," i. 366, note 1. Perhaps it is identical with Συγάλ πόλις of Stephanus. Cf. Droysen, *Geschichte des Hellenismus*, iii. 2, 217.

P. 299.—This extract from Vāyu-Purāṇa is found in *adhyāya* 45, vol. i. pp. 350–353, vv. 109–136. Alberuni gives the directions in the following order: east, south, west, north; whilst the Sanskrit text has this order: north, east, south, west. In comparing the following text with Alberuni, the *varietas lectionis* given in the footnotes of the Calcutta edition can sometimes be used with advantage.

V. 109.
kurupañcalāḥ sālvās caiva sajāṅgalāḥ

V. 110.
śūrasenā bhadrakārā bodhāḥ satapathēṣvaraiḥ
vatsāḥ kisashṭā kulyās ca kuntalāḥ kāśikosalāḥ.

V. 111.
atha pārśvē tilaṅgās ca magadhās ca vṛikaiḥ saha.

V. 115.—North.
vāhilkā vādhdhānās ca ābhīrāḥ kālatoṣaṇakāḥ
aparitās ca śudrās ca pahlavās ca carmakhaṇḍikāḥ.

V. 116.
gāndhārā yavanās caiva sīndhuṣauvīrabhadrakāḥ
śaka hradāḥ kulindās ca paritā hārapūrikāḥ.

V. 117.
ramaṭā raddhakatākāḥ kekayā daśamānikāḥ
kṣhatriyopanivesās ca vaśyaśūdrakulāni ca.
ALBERUNI'S INDIA.

V. 118.
kâmbojâ daradâs caiva varvarâh priyalaukikâh
pînas caiva tushârâs ca pahlavâ vâhyatodarâh.

V. 119.
âtrayââ ca bharadvâjâh prasthalâs ca kaserukâh
lampâkâ nanapâs caiva ptîkâ juhûdaih sahâ.

V. 120.
apagâ ca limadrai ca kirâtânâh ca jâtaya
ramâ harinsamârgâsca kâsmîrâs tângânas tathâ.

V. 121.
cûlikâs ca hukâs caiva pûrṇadarvâs tathaiva ca

V. 122.—East.
andhravâkâh sujarakâ antargiri vahirgirâh
tathâ pravangavangeya màladâ màlavarttinaîh.

V. 123.
brahmottarâh pravijaya bhârgavâ geyamarthakâh
prâgjyotishâs ca mundâs ca videhâs tâmaliptakâh
mâlâ magadhagovindâh.

V. 124.—South.
pândyâs ca keralâs caiva caulyâh kulyâs tathaiva ca
setukâ mûshikâs caiva kumanâ vanavâsikâh
mahârâshtrâ mâbhishkâh kalingâs ca.

V. 126.
abhîrâh saha caik 'shikâ âtavyâs ca varâs ca ye
pulindrâ vindhyamûlikâ vaisarbhâ daûdakaih sahâ.

V. 127.
ptnitkâ mauniâs caiva asmakâ bhogavardhanâh
nairnikâh kuntalâ andhrâ udbhidâ nalakâlikâh.

V. 128.
dûkshinâtâyâs ca vaideśâ aparâns tân nibhodhata
sûrpalârah kolavanâ durgâh kalitakah sahâ.
puleyāś ca surālāś ca rūpasās tāpasaih saha
tathā turasitās caiva sarvē caiva paraksharāh.

V. 130.
nāsikyā 'dyāś ca ye cānye ye caiva 'ntaranarmadāḥ
bhānu kacchhrāḥ samāheyāḥ sahasā sāśvatair api.

V. 131.
kacchhrāś ca surāshtrās, ca anarttaś ca 'rvudaiḥ saha.

V. 132.—West.
mālavāś ca karuṣhāś ca mekalāścō 'tkalaih saha
uttamarnā dasārṇāś ca bhojāḥ kishkindhakaiḥ saha.

V. 133.
tosalāḥ kosalāś caiva traipurā vaidikās tathā
tumurās tumbrāś caiva shaṭsurā nishadhaiḥ saha.

V. 134.
anupās tundikeraś ca vitihotrā hy avartayaḥ.

V. 135.
nigarharā hamsamārgaḥ kshupaṇās тाँगणāḥ khasāḥ.

V. 136.
kusāprāvaranaṇāś caiva hūṇā darvāh sahūdakāḥ
trigartā mālavāś caiva kirātās tāmasaiḥ saha.

Pp. 300–303.—This extract from Varāhamihira’s Samhita is taken from chap. xiv. Cf. the text in Kern’s edition, p. 87, the varietas lectionis, pp. 12–14, and his translation in “Journal of the Asiatic Society,” 1870, p. 81–86. The number of discrepancies between these two traditions is very considerable. In many places Alberuni and his Pandit may not have read their manuscript with sufficient accuracy; in others, the Sanskrit manuscript-tradition may exhibit blunders arising from a not uncommon confusion of characters that are much like each other. The Arabic manuscript-tradition is on the whole correct, but the
copyist of the Arabic text, too, may have contributed in some case to increase the number of errors. To some Indian names he has added explanatory glosses, e.g. Sau-
vira, i.e. Multan and Jharvar. It is a pity he has done this so sparingly.

P. 303.—Yakub and Alfazari.—Vide notes to pp. 169 and 165.

P. 304.—Abu Ma'shar, author of many books, chiefly on astrology, died A.H. 272 = A.D. 885. He is known to the Middle Ages in Europe as Albumasar.

P. 306. Cupola of the earth.—If this expression has not been derived from the Indian, the question arises, Who introduced it among the Arabs? Was it Alfazari?

P. 306. Ravana the demon.—The author refers to the fifth and sixth books of the Ramayana, which he apparently did not know, or he would not have called it, as he constantly does, the story of Rama and Ravidya; v. pp. 307, 310, and ii. 3. I have not succeeded in deciphering the name of the fortress; the Arabic signs cannot be combined with the name Tripura.

P. 308.—A straight line from Lavkot to Meru is also mentioned on p. 316. The first degree of longitude, according to the Indian system, is also described in Surya-Siddhanta, i. 62. Instead of Kurukshetra the author seems to have pronounced Kurukketr. At all events, he did not write a sh. Therefore the compound ksh must have undergone the Prakritic change into kkh, as in pokkharo = pushkara (Vararuci, iii. 29).

P. 309.—These wares are deposited, &c.—This kind of commerce with savage nations is the same as that carried on by Carthage with tribes on the west coast of Africa; v. Herodotus, iv. 196; C. Muller, Geographi Graeci Minores, i. p. xxvii., and Meltzer, Geschichte der Kauthger, p. 232 and 506.

P. 310.—Langabolics is identified with the Nicobar
Islands by A. Sprenger, Post- und Reiserouten des Orients, p. 88.

P. 312. Detentara.—Vide the rule for its computation in Sārya-Siddhānta, i. 60, 61.

Alarkand, Ibn Tārik.—Cf. note to p. 169.

P. 312.—Al-arkand is identified by Alberuni with the Khandakhādyaka of Brahmagupta (ii. 7). In another place (ii. 48) the author identifies the word arkand with ahargana. Both of these identifications can hardly be justified phonetically, and therefore I prefer to suppose as the Sanskrit original of Arkand a word like Āryakhanda, whilst apparently the word harkan (title of an Arabic calendar, ii. 52) is identical with ahargana.

The author complains of the Arabic translation of Al-arkand being a bad one, and at some time of his life (probably after the composition of the Indica) he has published a new and amended edition of this translation. Cf. preface to the Arabic edition, p. xx. The Arabic Arkand has not yet been discovered in the libraries of Europe. The author has borrowed from this book the following notes:—(1) 1050 yojanas are the diameter of the earth (i. 312, 316). (2) The latitude of Ujain is 22° 29', and that of Almansura 24° 1' (i. 316). Here the author states that also Ya'kūb Ibn Tārik had quoted the book, but erroneously. (3) The straight shadow in Loharānī is 5½ digits (i. 316). (4) Alberuni quotes from Alarkand a method for the computation of the era Shakh, by which the Gupta era is meant (ii. 48, 49).

P. 312.—On the relation between yojana and mile, v. note to p. 199.

P. 312, l. 22.—Using the ratio of 7 : 22 between diameter and circumference, we find 3300 yojanas as the circumference corresponding to a diameter of 1050 yojanas. So 3300 yojanas is the circumference of the earth given in the handbook Al-arkand. This agrees with the last lines of p. 315, where it is said that 3200 yojanas are 100 yojanas less than the value given by Al-arkand (Schram).
P. 313. The author of Karanatilaka, i.e. Vijayanandin. —Vide note to p. 156.

P. 313.—Vyastatrairdśika is a technical term for a certain algebraic calculation. Cf. Colebrooke, "Algebra," p. 34. § 76.

P. 314.—Alfandri in his canon, which was a translation of the Brahmasiddhanta of Brahmagupta; v. note to pp. 153, 165.

P. 314, l. 11.—The calculation of the deśāntara is, as Alberuni remarks, quite erroneous, as the difference of longitude is not taken into account (Schram).

P. 315, l. 25.—The number in the lacuna must be 80, for Alberuni says at the bottom of the page, "If we invert the calculation and reduce the parts of the great circle to yojanas, according to this method we get the number 3200." But to get 3200 we must multiply $\frac{80}{9}$ by 80. The rule, "Multiply the yojanas of the distance between two places by 9 and divide the product by 80," serves to convert this distance given in yojanas into degrees. This distance, then, is considered as the hypothenuse of a right-angled triangle, one of the sides of which is the difference of the latitudes, the other the unknown difference of the longitudes; this latter is found by taking the root of the difference of the squares of hypothenuse and known side. This difference of longitude is then expressed in degrees; to get it expressed in day-minutes we must further divide by 6, as there are 360° in a circle, but only 60 day-minutes in a day (Schram).

P. 316.—The line connecting Lānkā with Meru, already mentioned on p. 308.

P. 316. Yaḥūb Ibn Ṭārik, Alarkand.—Vide note to p. 169, 312.

P. 317. Catlaghtaghn.—Not knowing the etymology of this Turkish name, I am also ignorant of its pronunciation. The second part of the compound seems to be taghn=
valorous, as in Toghrultagin, i.e. valorous like a falcon. As خی.Frame, jilghan, means a large spear, one might think of reading Jilghattagin, i.e. valorous with the spear, but this is very uncertain. Another name of a similar formation is kullughtagin, katlagh, but probably entirely different. Vide Biberstein-Kazimirski, Menoutsehehrī preface, p. 136; Elliot, "History of India," ii. 352, iii. 253.

P. 317.—Karanasdra by Vitessevara; v. note to p. 156.

P. 317.—The fortress Lauhār, also mentioned p. 208 as Lahūr, must not be confounded with Lauhāvar or Lahore. Situation unknown. According to the author's Canon Masudicus, it has latitude 33° 40', longitude 98° 20'. Comparing these latitudes with those given in Hunter's Gazetteer, we do not find that they much differ:

<table>
<thead>
<tr>
<th>Ghazna</th>
<th>33° 34'</th>
<th>Hunter.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kabul</td>
<td>33° 35'</td>
<td>Alberuni</td>
</tr>
<tr>
<td>Peshavar</td>
<td>34° 47'</td>
<td></td>
</tr>
<tr>
<td>Jialam</td>
<td>34° 44'</td>
<td></td>
</tr>
<tr>
<td>Siyalkote</td>
<td>33° 20'</td>
<td></td>
</tr>
<tr>
<td>Multān</td>
<td>32° 58'</td>
<td></td>
</tr>
</tbody>
</table>


Mandakkakor (the name is differently written) was the fortress of Lahore, according to the author's statement in his Canon Masudicus.

Nandna is explained by Elliot ("History of India," ii. 450, 451) as a fort on the mountain Bālnāth, a conspicuous mountain overhanging the Jialam, and now generally called Tilla. Cf. also Elliot, l. c. ii. 346, note 347, 366.

The places Dunpūr (pronunciation perfectly uncertain) and Kandi (also read Kiri), the station of the Amīr, seem to have been on the road from Ghazna to Peshavar. Near the latter place was fought the decisive battle between King Mas'ūd and his blinded brother Muḥammad, a.d. 1040, and there the former was murdered by the relatives of those who ten years earlier had thought to win his favour by betraying his brother, and were killed or maltreated in reward. Cf. Elliot, l. c. iv. 199, note 1, 138, ii. 150, 112 (Persian text, p. 274), 273, note 3.
I conjecture Dunpūr to have been identical with Jalalabad or some place near it. Latitude of Jalalabad, 34° 24'; that of Dunpūr, 34° 20'.

Kandī, more southern than Dunpūr and nearer to Kābul, must have been a place like Gandamak or near it. If it is called the station (post-relai) of the Amīr. We may understand by this Amīr the father of King Maḥmūd, the Amīr Sabuṭkāsīn, who first constructed the roads leading to the Indian frontier, as Alberuni informs us on p. 322.

On the identification of Bamhanwā or Almansūra in Sindh, v. Cunningham, l. l. p. 271 seq.

The statements of Alberuni regarding the Kabul valley and environs have been laid down in a sketch-map of Aloys Sprengner, Post- und Reiserouten des Orients, No. 12; the Punjab and the approaches of Kashmir, ibid. No. 13.

P. 319.—Muhammad Ibn, &c., is the famous Rasas of the Middle Ages, who died probably A.D. 932. The author has written a catalogue of his works which exists in Leyden; v. Chronologie Orientalischer Völker von Alberuni, Einleitung, p. xi; Wüstenfeld, Geschichte der Arabischen Ärzte, No. 98.


P. 320. Varāhamihira.—This quotation corresponds to Sanskrit, i. v. 6, 7. Instead of Kumbhaka the Sanskrit text has Kanḍāda.

P. 322. Timæus.—This quotation seems to be derived from 42 D E:—

tο δὲ μετὰ τὸν σπόρον τοῦ τέκνος παρέδωκε θεοῖς σώματα πλαττεῖν θυτά, κ.τ.λ. καὶ λαβὼντες ὕθανατον ἀρχήν θυτοῦ ζώου, κ.τ.λ.
In the Arabic text, p. 203, 17, read izzā instead of izzā, and izzā instead of izzā.

P. 324. That being who is above him, i.e. a being of the next higher order.—The opposite of the term لمس بعلة is لمس دولة (for the being of the next lower order) on p. 177, 20 (translation i. 351).

P. 325. Viṣṇu-Purāṇa.—The first words, Mahārloka titles, &c., there is one kalpa, are found in ii. chap. vii. p. 226. The sons of Brahmā are mentioned in Viṣṇu-Purāṇa, ii. 209, note. The name Sanandana (Sananda-nātha?) is perhaps a mistake for Sanātana. Cf. Sāṁkhya Kārikā with the commentary of Gauḍapāda by Colebrooke-Wilson, p. 1.

P. 325. Abū-Mā'ṣhar.—Vide note to p. 304.

P. 325. Alerānshahr.—Vide note to pp. 6, 7.

P. 327. The country without latitude, i.e. nirakṣha in Sanskrit.—Vide p. 267, and Sūrya-Siddhānta, xii. 44, note.

P. 330. Āryabhata of Kuśumapura, i.e. junior.—Cf. note to p. 246.

P. 333.—The terms parārdha and kha have been explained, pp. 175, 178.

P. 334. The book Srūdhava by Utpala.—Vide notes to pp. 157, 158.

A system of the measures of time has also been given by Colebrooke, "Essays," i. 540 seq.

P. 336. Ś-M-Y.—This name is so written here and p. 337. The Arabic signs are to be read Šammīt or Šamīyyu. I do not know a Sanskrit name of this form. Is it Samaya?

The same name seems to occur a third time, ii. 188, but is there written S-M-Y. Alberuni says that S-M-Y had dictated a method for the computation of the samkrānti;
he therefore, perhaps, was a scholar of the time and a personal acquaintance (teacher?) of Alberuni’s. The title of a book of his is not mentioned.

P. 338.—The spēd muhra or white shell, an Indian blowing instrument, is also mentioned by Elliot, “History of India,” ii. 215, note.

Purshûr (پرور), as the manuscript has, is probably a mistake for Purushâvar, i.e. Peshavar.

P. 338. Horæ æquinociales and temporales.—Vide note to p. 214.

P. 339. The commentator of the Siddhânta, Pulisa.—Read instead of this, “The commentator of the Siddhânta of Pulisa,” and compare note to pp. 153, 154. Who this commentator was is not mentioned.

P. 340.—Abhijit means the 8th muhūrta of the day. The Arabic form عبد! corresponds perhaps to Sanskrit abhijiti.

P. 340. Vyāsa.—This statement points to Mahâbhârata, the Ādi-parvan, v. 4506; but the chronological detail is not found there.

P. 340. Śiśupāla.—Vide note to p. 165.

P. 342.—The names of the dominants of the muhūrtas are also mentioned in the following four lines taken from Aufrecht’s Catalogue of the Sanskrit manuscripts of the Bodleian Library, p. 332a:—

rudrāhimitrapitaro vasuvāriviśve vedhā vidhiḥ satama-khaḥ puruhûtavahini.

naktaṁcarnā ca varuṇāryamayonayaś ca proktā dinā daśa ca paṁca tathā muhûrtāḥ

niśāmuhûrtā giriśaṇapādâhirbudhnyapûshâsviyanâmâgna-yaśca.
ANNOTATIONS.

vidhâtricâmdrâditi jîvavishñutigmadyutivâshthrasamâranâñâ ca.

P. 343. Except the astrologers.—Cf. the meaning of hord in astrology, ii. 222.

P. 343. Vijayanandin.—Vide note to p. 156. The title of his book would be in Arabic غزارة الأركان (Ghurrat-ul-zîtât).

P. 344. Names of the hords.—I have not found these names in Sanskrit. Perhaps they are mentioned in some commentary to Sûrya Sûddhânta, xii. 79.

On Srâdhava, u. note to p. 158.

P. 347. Physical scholars know, &c.—There is a similar passage on the physical effects of moonlight in the author's "Chronology of Ancient Nations," p. 163. I am afraid I have not caught the sense of the sentence, "and that she affects (?) linen clothes," &c.

P. 348. Atuh (?).—The MS. seems to read âtvahhu.
The word ॐ, Brâhâ, is perhaps a mistake for ॐ, bârkhâ, which, according to the table, ii. 197 (cf. Trumpp, "Grammar of the Sindhi Language," p. 158), is the name of the first day of a paksha.

P. 348. Veda.—The author gives six quotations from the Veda: one taken from Patañjali (i. 29), one from Saûkhya (i. 31), two from the Brahmâsûddhânta of Brahmagupta (ii. 110, 111), and two quotations which were probably communicated to him by his Pandits, as he does not mention a particular source whence he took them (i. 348 and ii. 348).

P. 352. Vâsudeva.—The quotation corresponds to Bhagavad-Gîtâ, viii. 17.
The book Smriti.—Vide note to p. 131. This quotation seems to have been taken from Manu, Dharmaâststra, i. 72.
P. 353.—The information on the four mānas (cf. Sūrya-Siddhānta, chap. xiv.), as given by Ya'kūb, was the only one at the disposal of Alberuni at the time when he wrote his "Chronology" (v. English edition, p. 15). It was communicated to him by the Kitāb-alghurra of Abū Muḥammad Aḥnâ'ib Alâmund. The four different kinds of spaces of time mentioned there are the four mānas, saura, sāvana, candra and nakshatra.

P. 353.—Bhukti, in Arabic buht, is the daily motion of a planet; cf. Sūrya-Siddhānta, i. 27, note, and here, ii. 195. The Arabic form does not seem to have passed through an intermediate stage of a Prakritic nature, for in Prakrit it would have been bhutti (Vararuci, iii. 1).

P. 355. The sāvana-māna is used, &c.—Cf. the similar rules in Sūrya-Siddhānta, xiv. 3, 13, 15, 18, 19.


P. 357. Ritu.—Vide the description of the six seasons in Sūrya-Siddhānta, xiv. 10, 16.

P. 358. Dominants of the halves of the months.—I do not know a Sanskrit list of these names. The Āṣana (Āshunu) perhaps means Ābvin or Ābviṅ.

P. 359.—Dimas (probably pronounced dimasu) = Sanskrit divasa, is the shibboleth of the Indian vernacular dialect spoken round Alberuni, and probably by himself. I do not know which dialect this was, nor whether there are any traces of it in our days. The change between v and m is also observed in the following examples:—

\[
\begin{align*}
carmamāt &= \text{carmavatt (Chambal),} \\
ḥimamānt &= \text{himavant,} \\
jāgamalka &= \text{yajnavalkya,} \\
maccī &= \text{vatya,} \\
sugrīna &= \text{sugrīva.}
\end{align*}
\]

Some examples of the change of v to m are also given by Hörnle, "Comparative Grammar," § 134.

P. 359. The three sounds h, kh, and sh, &c.—On the pro-
nunciation of śh as kh, cf. Hörnle, l. c. § 19, and on the further change of kh to h, ibid. § 19. Examples of the former change are numerous in the Indica; of examples of the latter, cf. munha = mukha, bhrāhān = vaprakhāna (?) and also āhārya dharā, cf. ashādha, kāhāhā = kishikindha. In Prakrit mūham = mukha (Vararuci, ii. 27).


P. 362. 1 ghaṭi = 16 kālā.—Cf. with these measures of time the statements on pp. 336, 337.

P. 364. Chapter XL.—It has also been translated by Reinaud, Fragments Arabes et Persans, pp. 155–160.

P. 364. Samādhi udaya and samādhi astamana.—One would expect samādhyudaya and samādhyastamana, but there is no trace of a y. The forms have a vernacular character, and must be explained according to the analogy of duṭi = dyuti, and antau = antyaja.

Hiranyakaśipu.—The story of this king and his son Prahalāda is told by the Vishnu-Purāṇa, ii. 34 seq.

P. 366. Samādhi.—The way it is used in astrology is shown by the table, ii. 219.

P. 366. Puṇjala.—Vide note to p. 157. The tradition here given is very similar to that mentioned by Colebrooke, "Essays," ii. 332, 333.

P. 366, l. 35.—We find that the beginning of the Hindu solar year 854 Sakakala takes place A.D. 932, March 22, 6 ghaṭi 40° 15′, which corresponds to March 22, 7 h. 40 m. civil Greenwich time, whilst the real instant of the solstice is March 15, 12 h. 15 m. civil Greenwich time, so that the solstice precedes the calculation by 6 days and 19 hours, which agrees very well with the 6° 50′ which Puṇjala mentions (Schram).
P. 368. Ahargana = ahar + gana.—The author’s erroneous explanation is repeated ii. 26.
Sind-hind = siddhānta.—It may be questioned whether the inorganic न has been introduced into the word by the Arabs, or whether it existed already in the pronunciation of the Hindus from whom they learned the word. I do not know of a rule to this effect in Prakrit or vernacular, but there are certain Indian words which apparently show a similar phonetic process. Cf. e.g. Prakrit utkī (Sanskrit, uṣṭra), which in Eastern Hindī has become ० or Ṽ. Hörnle, “Comparative Grammar of the Gaudīyan Languages,” § 149.

P. 370. Āryabhāta, sen.—Vide note to p. 156.
Āryabhāta of Kusumapura. Vide note to p. 246.
The word I cannot decipher may be read السف, i.e. the article and three consonants with three dots above them, something like اسف.


P. 372. The book Smaṛiti mentions.—This is Manu, Dharmaśāstra, i. 80.

P. 375. A translation of his whole work, &c.—Cf. note to pp. 153, 154. Alberuni was translating the Pulisa-Siddhānta, which until that time had not yet been translated into Arabic by Muslim scholars, because they did not like its theological tendency.


P. 378. In writing the introductory sentences of chap. xliii., the author seems to have had in mind Plato’s Timaeus, 226: πολλαὶ καὶ κατὰ πολλά φθοραὶ γεγονασών ἀνθρώπων καὶ έσονται, κ.τ.λ.

i. p. 23. The name اَلْوَس seems to be a repetition of the name Hippolochos. If it is dropped from the list, we have the fourteen generations which the author counts between Hippocrates and Zeus.

The Arabic مالون seems to be a mistake for مالون, Machaon.

P. 380. Parākūrama.—Vide this legend in Vishnupurāṇa, iv. 19 (here added from the Mahābhārata).

P. 380. Buddhodana.—Vide my conjecture as to the origin of this name in note to p. 40.

The Muhammira.—This term has been explained in note to p. 21.

P. 382. Garga, the son of.—The name of his father is written Jashū or Jashū (here and p. 397). Could this be Yaṣhadā?

P. 382.—Alī Ibn Zain was a Christian physician in Merw; cf. Shahrazūrī, MS. of the Royal Library, Berlin, MS. Or., octav. 217, fol. 144b; the same in Baihākī, ibid. No. 737, fol. 6a. According to this tradition, his son was the author of the famous medical book Firdaus-alhikma. Cf. also Fihrist, p. 296 and notes; Wüstenfeld, Geschichte der Arabischen Aerzte, No. 55.

The book Caraka.—Vide note to p. 159.

P. 383. Krīṣa, the son of Ātreya.—If this is what the author means, the Arabic signs مَسْرُوس must be altered to مَسْرُوس. Cf. A. Weber, Vorlesungen, p. 284, note 309.

P. 383.—The quotation from Aratus is Phaenomena, vv. 96–134. I give the text from Imm. Bekker, Aratus cum Scholiis, Berlin, 1828:

'Αμφοτέροις δὲ ποσοὶν ὑποσκέπτειον βούτεων
Παρθένοι, ἡ ῥ' ἐν χερσὶ φέρει Στάχυν αἰγλήντα.
εἴτ' οὖν 'Αστραίοις κεῖνη γένος, ὅν ρά τε φασιν
ἀστρων ἀρχαῖον πατέρ' ἐμμεναι, εἴτε τεν ἄλλου,
ἐυκήλος φορέωτο· λόγος γ' μὲν ἐντρέξει ἄλλος
ανθρώπους, ὡς δὴθεν ἐπιχθονίη τάρος ἦν, ἥρχοτο δ' ἀνθρώπων κατεναντίῃ, οὔδὲ τοι' ἀληθῶν οὔδὲ τοι' ἀρχαῖων ἡμίματο φύλα γυνακῶν, ἀλλ' ἀναμιξ' ἐκάθεν καὶ ἄθανάτῃ περ ἐνύσα. καὶ ἦ Δίκην καλέσκουν ἀγειρομένη δε γέροντας ἦ τοι εἰν ἀγορὴ ἢ εὐρυχόρφο εἰν ἀγυμή, δημοτέρας ξειδεν ἐπισκέφχουσα θείστας, οὔτω λευμάλεου τότε νείκεσ ήκίστατο, οὔτω διαμερίσος περιμεμφέος οὔτε κυδομοῖο, αὐτῶς δ' ἔξων. χαλεπῇ δ' ἀπέκειτο θαλασσα, καὶ βίον οὔτω μητ' απόπροθεν ἡγίνεσκον. ἀλλὰ βόες καὶ ἀροτρα καὶ αὐτὴ πότνια λαῶν μωρὰ πάντα παρεῖχε Δίκη, ἀπείρωρα δικαίων. τοῦτο ἦν ὁφρ' ἐτ' γαία γένος χρύσεων ἐφερβεν. ἀργυρέω δ' ὀλίγη τε καὶ οὐκέτι πάμπαν ὁμοῖα ἐμίλει, ποθέοντας παλαιῶν ἥθεα λαῶν. ἄλλη ἐμφασι' ἐτ' κείνῳ κατ' ἀργύρων γένοις ἦν. ἥρχοτο δ' ε' ὁρέων ύποδέλοιο ήχοντων μοναξ' οὔτε τερ' ἐπεμίσχετο μειλχίοισιν. ἀλλ' ὄποτ' ἀνθρώπων μεγάλας πλύσαιτο κολώνας, ἰπτελεὶ δὴ ἐπετα καθαπτομένη κακότητος, οὔτ' ἐτ' ἐφι' εἰσωτ' ἐλεύσεσθαι καλέοντιν. οἶνον χρύσεων πατέρες γενεὴν δίποντο χειροτέρην. ὑμεῖς δὲ κακότερα τεξείσθε. καὶ δὴ τοῦ πόλεμοι, καὶ δὴ καὶ ἀναστών αἷμα ἐσσεται ἀνθρώπωσι, κακοῖς δ' ἐπικεῖσται ἀλγός. ὡς εἰπὼν' ὅρεων ἐπεμαίετο, τοὺς δ' ἅρμα λαῶς εἰς αὐτὴν ἐτί πάντας ἐλίμαται παπαίνοντας. ἀλλ' ὅτε δὴ κάκεινοι ἐτέθνασαν, οἱ δ' ὑγενότου, χαλκεῖν γενεὴ, προτέρου ὁλοκτεροὶ ἀνδρὲς, οἱ πρῶτοι κακοεργῶν συγκεκριμένο ὑπάρχαν εἰνοίδερ, πρῶτοι δὲ βοῶν ἐπάσαντ' ἀροτήρων, καὶ τότε μεσήσασα Δίκη κεῖνων γένος ἀνδρῶν ἐπηθ' ὑπορραψί.

P. 385. Plato.—This quotation is from Leges, iii. 677; but the phrases forming the conversation have been omitted.

ἈΘΝ. Τὸ πολλὰς ἀνθρώπων φθορὰς γεγονέναι κατακλυσμοῖς τε καὶ νόσους καὶ ἄλλους πολλοῖς, ἐν οἷς βραχὺ τι τὸ τῶν ἀνθρώπων λείπεσθαι γένος, κ.τ.λ. ὥσις οἱ τότε περιφυγόντες τὴν φθορὰν σχεδὸν ὁρεινῷ τινε ἀν εἰν νομεὶς ἐν κορυφαῖς που, σμαρά ἑωπυρα τοῦ τῶν ἀνθρώπων γένους διασεσσομένα, κ.τ.λ. καὶ ὅ τις τούτων γε ἀνάγκη ποι ἄλλων ἀπείρους εἶναι τεχνῶν καὶ τῶν ἐν τοῖς ἁστεί πρὸς ἄλληλους μηχανῶν εἰς τε πλεονεξίας καὶ φιλονεκίας καὶ ὁπός ἄλλα κακοφηγήματα πρὸς ἄλληλους ἐπινοοῦσιν.

P. 387.—Cf. with this table Vishnu-Purāṇa, book iii. chap. i. and ii., and the Bombay edition, 1886.

Stāmasa seems to be a mistake for Tāmasa.

Caitrakā instead of caitra seems to have been derived from an erroneous reading of the beginning of the Sanskrit caitrakīṇupurushādhyāṣa.

Sudīvya seems to have risen from a wrong division of the words Paraśu (other readings Parabhu, Parama) Divya. The Bombay edition reads prajāhparamadivyādhyāṣasya.

Antala, the name of Indra in the fifth Manvantara, can hardly be combined with the Viṣhu of Sanskrit tradition.

Śindhu, Revā.—These words, whatever their proper pronunciation may be, are not found in the Sanskrit text.

Puru Muru is Sanskrit Uru Puru, but Pramukha is a gross mistake, for the text has urupuruṣatadvyumnapramukhāh, i.e. Uru, Puru, Satadyumna, and others.

Nabasa and Dhrishīna are mistakes for Nabhaga and Dhrisha.

Virajas, Askavart, Nirmogha.—The Sanskrit text runs viracāскопariṇāṁścānirmohādyaś, which Alberuni has divided into viraja-asācopequiṇāṁścā-nirmohā. Cf. Scor-
vart Vāṁśa on p. 394. Wilson reads the second name Arvarivat.

Mahāvṛtya, name of Indra in the ninth Manvantara, instead of Adhikuta, rests on a misinterpretation of these words: teshām indrō mahāvṛtyo bhavishyatyadhuvāto dvija.

Sudharmatman.—The Sanskrit text has Sarvadharma.

Devata Vāṇupadevāśca, instead of Devavat and Upadeva, rests on a wrong division of the words devavāṇupadevāśca.

Vicitra-adyā, a mistake for vicitrādyā, i.e. Vicitra and others.

Uru, Gabhī (sic MS.), Budhnya-adyā, a mistake for ururgabhītrabudhnyaadyā, i.e. Uru, Gabhīra, Budhnya, and others.


P. 391. The almanac or calendar from Kashmir for the Śaka-year 951 (A.D. 1029) is quoted in two other places, ii. 5 and ii. 8.


P. 392. Only by 525 years.—Cf. on Varāhamihira note to p. 54.

P. 392. Karanasāra by Vitteśvara.—Vide note to p. 156.

P. 394.—This table is taken from Vishnu-Purāṇa, book iii. chaps. i. and ii.


Niśvara.—Alberuni read Niśava.

Ścorvar Vāṁśa.—The author has wrongly divided the


Caitragni, as the author has, is a mistake for Caitragnti.


5. Manvantara: Rudhvabahu has risen through the wrong division of the two words vedaṣṭिर्दर्भवाहु.

APRA has by mistake been taken for a proper noun in the following words:—ardhvabhastathaparaka.

SUBHAU (Sravabahu) ?—The Sanskrit text has svadhāman.

6. Manvantara: Atimāman.—The Arabic text has atimānu. Or are we to read اتامان instead of اتامان?

CARSHAYAH (= and the Rishis) by mistake derived from the following passage:—saptāsanīticarshayah.


MEDHĀDHARITI (Wilson-Hall), medhāmrīti (ed. Bombay). Alberuni seems to have read Vedačchādhānti, if we are not to read بيداره instead of بيداره.

10. Manvantara: Satya (Wilson-Hall).—The Arabic has something like Sattayā.

SUKSHERA.—The Arabic has Sushera instead of Satyaketa. Perhaps the author has overlooked this word and copied the following one, viz., Sukshetra.


AGNĪDHRITI = Agnītejas. The Arabic has agnītu, which is perhaps to be changed to agnītejas (agnītejas).

NAGHA.—Wilson-Hall, Anagha.


Perhaps the author has read sutapāśca.

DYUTI and ISVANYAS have by mistake been derived from the following verse—

tapodhritirdyutisvanyahsaptamastutapodhanah.

13. Manvantara: Tatvarāśča, mistake for Tatvadarśin, for the Sanskrit text has tatvadarśa.

VYAYA, mistake for AVYAYA. The author seems to have read dhritimān vyayaśca instead of dhritimānvyayaśca.


GURHRA.—The ed. Bombay reads māgadhognidhranvaca. Other readings, GURHRA, AGNĪDHRITI.

VOl. II.
Yuktasa and Jita are taken from the following verse—
yuktas-tathā-jitā-cānya-manuvṛtṛn atah īrṇu.

P. 395.—Vālakhilyas are known as pigmy sages from the Vishnu-Purāṇa, but I do not find there this story of them and Satakratu.

P. 396. Bali, the son of Virocana, and his Vazir Venus, i.e. Sukra.—Vide Vishnu-Purāṇa, iii. p. 19, note. There is a Hindu festival called after him Balirāja; v. ii. 182.

P. 397. Vishnu-Purāṇa.—This quotation is found III. ii. p. 31.

P. 398.—The second quotation from Vishnu-Purāṇa is III. iii. p. 33.
Kali, the son of Jashō (?)—Vide note to p. 382.

P. 398.—The names of the Vyāsas of the twenty-nine Dvāpara-yugas have been taken from Vishnu-Purāṇa, III. iii. pp. 34–37. The author's tradition differs a little from the Sanskrit text, in so far as he does not always combine the same Vyāsa with the same Dvāpara, particularly towards the end of the list. The names agree in both traditions, except Trivrisa, for which the Arabic has something like Trivarta or Trivritta. Besides, in the word Rinajyeshta (in Arabic Rinajertu) the author has made a mistake. The Sanskrit verse runs thus—

kṛtāmjayāḥ sapātāḥā ṛina-jyeshṭādāḥā śmrītāḥ.

Alberuni has read ṛina-jyeshtoṣṭādāḥā instead of ṛina-jyeshṭādāḥ, and has wrongly divided these words into ṛina-jyeshṭo-ashṭādāḥā instead of ṛina-jyo ashṭādāḥā. Further, he has been guided by the analogy of jyaishtha (the name of the month), which in vernacular was pronounced jertu, in changing ṛina-jyeshta into rinajertu.

P. 398. Vishnu-Dharma.—In mentioning Vāsudeva, Sanhkarshaṇa, &c., as the names of Vishnu in the yugas, this source agrees with the teaching of the sect of the Bhāgavatas or Pāṇcarātras.—Vide Colebrooke, "Essays," i. 439. 440.
P. 401.—The story of the birth of Vásudeva, i.e. Kṛṣṇa, is related in the Viṣṇu-Purāṇa, book v. chap. iii.

P. 403. The children of Kaurava, &c.—The following traditions are taken from the Mahābhārata: the dice-playing from book ii., or sabhāparvan; the preparing for battle from book v., or udyogaparvan; the destruction of the five brothers by the curse of the Brahmin from book xvi., or mausalaparvan; their going to heaven from book xvii., or mahāprasthānāparvan.

The introductory sentence of this relation, وکان اولاد کور علی بن العموس, literally, “The children of Kaurava were over their cousins,” is odd, and perhaps not free from a lacuna. Pāṇḍu had died, and his children grew up in Hastinapura, at the court of Kaurava, i.e. Dhṛtarāṣṭra, their uncle, the brother of Pāṇḍu. One expects a sentence like “The children of Kaurava cherished enmity against their cousins,” but as the Arabic words run, one could scarcely translate them otherwise than I have done. The children of Kaurava had “the charge of their cousins,” &c.


Mankalus seems to be a mistake for Myrtillus. Cf. Eratosthenis Catasterismorum Reliquiae, rec. C. Robert, p. 104. The source of Alberuni seems to have been a book like the chronicle of Johannes Malalas.

The second tradition, taken from a commentary on Aratus’ Phaenomena (vide note to p. 97), is found in the same book, Eratosthenis, &c., p. 100, 98. For this information I am indebted to my colleague, Professor C. Robert.

P. 408.—The number 284,323 of people who ride on chariots and elephants is a mistake for 284,310. I do not see what is the origin of this surplus of 13 men. However, the wrong number must be kept as it is, since the author reckons with it in the following computation.
ANNOTATIONS.

VOL. II.

P. 1.—The famous chronological chapter xliv. consists of two parts of very different value. Part i., on p. 2–5, an explanation of the mythical eras of the Hindus, is taken from the Vishnu-Dharma, on which work cf. note to i. P. 54.

Part ii., on p. 5–14, containing information of a historical character, has not been drawn from a literary source. If the author had learned these things from any particular book or author, he would have said so. His information is partly what educated people among Hindus believed to be historic and had told him, partly what he had himself observed during his stay among Hindus and elsewhere. That their historic tradition does not deserve much credit is matter of complaint on the part of the author (on pp. 10, 11), and that altogether the description of historic chronology, as far as he was able to give it, is by no means in all points satisfactory, is frankly admitted by the author himself (on p. 9). Whatever blame or praise, therefore, attaches to this chapter must in the first instance be laid to the charge, not of Alberuni, but of his informants. What he tells us is to be considered as the vulgata among educated Hindus in the north-west of India in his time.

Although the tales which had been told Alberuni may not have been of a high standard, still it is much to be regretted that he has not chosen to incorporate them into his Indica (cf. p. 11, I–6).

Whether his hope (expressed on p. 8), that he might some day learn something more of this subject, was realised
or not, I cannot make out. However, the stray notes on Indian chronology scattered through his Canon Masudicus, which he wrote some years after the Indica, do not seem to betray that his Indian studies had made much progress.

In all researches on Indian chronology, Alberuni's statements play an eminent part, specially those relating to the epochs of the Śaka and Gupta eras. Cf. among others the following publications:


M. Müller, "India, What can it teach us?" pp. 281, 286, 291.

P. 2.—As the author had to compare a number of different eras with each other, he stood in need of a common standard to which to reduce all of them, and for this purpose he chose the New-Year's Day or first Caitra of the year 953 of the Śaka era, which corresponds to—

1. A.D. 1031, 25th February, a Thursday.
2. A. Hījarā 422, 28th Ṣafar.
3. A. Persarum 399, 19th Ispandârmadh-Mâh.

The Nauroz or New-Year's Day of the Persian year 400 fell on 9th March 1031 A.D., which is the day 2,097,686 of the Julian period (Schräm).

P. 2, l. 30.—This refers to the year of the kāliyuga 3600, as there have elapsed 10 divya years or 3600 years of the present yuga. On the next page Alberuni makes the calculation for the gauge-year, or the year 4132 of the kāliyuga. A kalpa being a day of Brahman, 8 years, 5 months, 4 days correspond to $8 \times 720 + 5 \times 60 + 4 \times 2$, or 6068 kalpas, or 26,213,760,000,000 years. Of the present kalpa there have elapsed six manvantaras or 1,840,320,000 years, seven samhīs or 12,096,000 years, twenty-seven caturyugas or 116,640,000 years, the kritayuga or 1,728,000 years, the tretayuga or 1,296,000 years, the dvaparayuga or 864,000 years, and of the kāliyuga 4132 years; so altogether of the seventh manvantara 120,532,132 years,
of the kalpa 1,972,948,132 years, and of Brahman’s life 26,215,732,948,132 years, as stated p. 3, ll. 6–9 (Schram).

P. 3. It was I who told it to Yudhishthira, &c.—The author of Vishnu-Dharma refers in these words to the third parvan (vanaparvan) of the Mahābhārata.

P. 4, l. 29.—From the beginning of Brahman’s life to that of the present kalpa there have elapsed 6068 kalpas or 6068 x 1008 x 4,320,000 or 26,423,470,080,000 years. Six manvantaras = 6 x 72 x 4,320,000 or 1,866,240,000 years; twenty-seven cataryugas = 27 x 4,320,000 or 116,640,000 years; three yugas + 4132 years = 3 x 1,080,000 + 4132 or 3,244,132 years. The latter number represents the years elapsed of the caturyuga; adding to it successively the other numbers of years, we find the numbers given ll. 29–31 of this page. The Arabic manuscript has 26,425,456,200,000 instead of 26,425,456,204,132 (Schram).

P. 6, l. 3.—In the book Srūdhava, &c., cf. note to i. p. 158. Candrabhija.—I first took the reading of the manuscript to be جمانهر, but now I believe I can see a pale dot above the last consonant, so that we may read جمانهر.
On the shashtyabda, or sixty-years cycle, cf. chap. lxii. p. 123.

P. 6. The epoch of the era of Śaka, &c.—Alberuni speaks of this era in his Canon Masudicus (composed during the reign of Mas‘ud) in the following terms: هو كال راهب التوازيع عدهم وحالة عدد منفعتهم هكاكان ان رقع سق وحسب من ستة هكله لأنه كان منفعتا عليه والرسم فيه وفي غيرها ان تلك ستية النشاة دون الناشة. (Beginning of the sixth chapter, book i., copied from the Codex Elliot, now in the British Museum.)
Translation: “Time is called Kāla in the language of the Hindus. The era most famous among them, and in particular among their astronomers, is the Śakakāla, i.e. the time of Śaka. This era is reckoned from the year of his destruction, because he was ruling (rather, tyrannising) over it (i.e. over that time). In this as well as in other
eras it is the custom to reckon only with complete, not with incomplete or current years."

Then the author goes on to give rules for the comparison of the Śaka era with the Greek, Persian, and Muslim eras.

A later author, 'Abū-Sa'īd 'Abd-alħayy Ibn Alḏahḥāk Ibn Maḥmūd Gardēzi (Gardez, a town east of Ghazna), has reproduced the information of Alberuni on the Śaka era in Persian. Not having the original (MS. Ouseley 240, Bodleian Library, Oxford) at my disposal, I give a translation made years ago:—

"The Hindu era is called جکل, because یکل (kal) means time, and یکل (Saka) is the name of a king whose death was made an era; he did the Hindus a great deal of harm, so they made the date of his death a festival" (Oxford manuscript, p. 352).

The place یکل is also mentioned in the Chachnāma. Vide Elliot, "History of India," i. 139, 143, 207.

P. 7. Al-arkand.—Cf. note to i. 312. The book does not seem to exist in the collections of Arabic manuscripts in Europe.

P. 8.—The pronunciation of the names Kanfr, Bardart, Mārgala, and Nitrabara (Nira-riha?) is more or less conjectural.

Alberuni identifies Mārgala with Takshašila (vol. ii. 302), i.e. the Taxila of the ancients. The name Mārgala seems to be preserved in that of a range of hills lying only two miles to the south of Shahdhesi (Cunningham, "Ancient Geography of India," p. 111). The place is also mentioned in the یکل-کن. Vide Elliot, "History of India," ii. 271, 273.

P. 9.—Durlabha, a native of Multān, is only twice mentioned. Here the author quotes from him a method for the computation of the Śaka era, and p. 54 a method for the computation of ahargana. According to him, the Indian year commenced with the month Mārgaśīrsha, but the astronomers of Multān commenced it with Caitra (p. 10).

P. 10. Barhataktin.—The name occurs only in this one
place. If it were an Indian name, I should think of something like Vrihatktna (or Vrihatketu بريهاكت). If it is Turkish, it is a compound, the second part of which is tagin (as in Toghrultagin and similar names). As the author declares the dynasty to be of Tibetan origin, the question is whether the name may be explained as Tibetan.

P. 10. Var.—As the Arabic verb may be connected either with the preposition bi or with the accusative, we may read either bwr or wr.

P. 10, l. 25. He began to creep out.—In the Arabic text, p. 74, 8, read ﷲ instead of ﷲ ﷲ.

P. 11. Kanik.—Only the three consonants KNK are certain. We may read them Kanik or Kanikk, which would be a Middle-Indian Kanikkhu for Sanskritic Kanishta. Thus the name Turk was pronounced by the Middle-Indian tongue as Turukkh, and Sanscritized as Turuskh.

This Zopyrus-story was reproduced by Muhammad 'Auft. Cf. Elliot, "History of India," ii. 170.

P. 13. Lagatrmân.—The uncouth formation of this name seems to point to a Non-Indian (Tibetan?) origin. I at first thought to combine it with the name of the Tibetan king, Langtarma, who abolished Buddhism, A.D. 899 (v. Prinsep, "Useful Tables," ii. 289), as our Lagatrmân was the last of a series of Buddhistic kings, and as the names resemble each other to some extent. However, this combination seems delusive.

The name Kallar is written Kallr ﷲ. Could this name be combined with Kulusha (Kalusha ﷲ), which e.g. occurs as the name of the Brahmin minister of the Maharatta Raja Sambaji?

P. 13, l. 17. The Brahman kings.—The word såmanta means vassal.

Kamal was a contemporary of the prince 'Amr Ibn Laith, who died A.D. 911. Cf. Elliot, "History of India," ii. 172. Is the name a hypokoristikon of one like Kamalavardhana?
Ánandapála, Bhimapála, and Trilocaṇapála mean having Śiva as protector. If, therefore, these princes, like the Indo-Scythian kings (cf. Drouin, Revue Numismatique, 1888, 48), were Śiva-worshippers, we must explain the name Jāipāl perhaps as Jāyipāla, i.e. having Durgā (the wife of Śiva) as protector. Cf. the Hindu kings of Kabul in Elliot, "History of India," ii. 403 seq. (in many points antiquated).

The name Trilocaṇapála (here Šarúcanpál) has been much disfigured in the Arabic writing. Vide the Puru Jaipal in Elliot, l.c., ii. 47, 463, 464.

P. 13, 1. 14. The latter was killed.—The Arabic manuscript has جمّ, which may be read جمّ (narratum est) or جمّ (interfectus est). I have not been able to ascertain whether the year in question was that of the enthronisation of Trilocaṇapála, or that of his death. I prefer, however (with Reinaud), to read جمّ, "he was killed," because evidently the author stood so near to the events in question that he could have ample and trustworthy information, and that, in fact, an on dit (جلّ) seems here entirely out of place.

P. 13, 1. 22. The slightest remnant, literally one blowing fire, a well-known simile for nobody. Cf. e.g. Hasan Nizámi in Elliot's "History of India," ii. 235, 1. 13.

P. 15.—For Alfażārī and Yaḵūb Ibn Ṭarīk, cf. note to i. 165, 169.

Muhammad Ibn Ishāk of Sarakhs is mentioned only here and in the tables on pp. 16 and 18, besides in Alberuni's "Chronology" (English edition, p. 29).

P. 16, 1. 6 of the table.—It is not clearly said in the text that the anomalistic revolution is meant, but the numbers which Alberuni quotes leave no doubt on the subject. The days of a kalpa are 1,577,916,450,000, which being divided by the number 57,265,194,142, give for one revolution 271,118,144,144 days, or 27 days 13 h. 18 min. 33 sec., whilst the anomalistic revolution of the moon is equivalent to 27 days 13 h. 18 min. 37 sec., an agreement so very close, that every doubt that there could be meant
anything but the anomalistic revolution is completely excluded. Moreover, the number of the revolutions of the apsis, 488,105,858, being augmented by 57,265,194,142, is equal to 57,753,300,000, the number of sidereal revolutions; and, indeed, the revolutions of the apsis, plus the anomalistic revolutions, must be equal to the sidereal revolutions (Schram).

P. 16.—The note in the table “The anomalistic revolution of the moon is here treated,” &c., is not quite clear, and probably materially incorrect. That the term حامة القدر means the anomaly (ἀνωμαλία in Greek, kendra (κέντρον) in Sanskrit), was first pointed out to me by my friend and colleague, Prof. Förster; but this note, which seems to be intended as a sort of explanation of the term, does not exactly render what astronomers understand by anomaly. Literally translated it runs thus: “The Ḥāṣṣat-alkamar stands in the place of the apsis, because the result is its (whose? the apsis’) share, since it (the Ḥāṣṣat-alkamar) is the difference between the two motions” لاَّنَّ ما يَخْرُجْ يَكُونَ (حَمَةَ الْحَدِ.) (not (اً) هَيْ فَضْلًا مَا بَيْنَ الحَرْكَتِين). Accordingly, we must translate the term as “falling to the moon as her lot or share,” viz., movement, in Arabic الحركة الحامة القدر. Therefore, in the Arabic text, pp. 11 and 16, 8 write حامة instead of حامة.

P. 19.—Abû-al-ḥasan of Ahwâz is mentioned only in this place. He seems to have been a contemporary of Al-fazârî and Ya’kûb Ibn Ṭârîk.


P. 21, l. 24.—A catayuga or 4,320,000 solar years consists of 53,433,300 lunar months or 1,602,999,000 lunar days; so one solar year has 371\(\frac{3}{9}\) lunar days, and the difference between the solar and lunar days of a year is 11\(\frac{9}{15}\). The proportion 360 lunar days: 11\(\frac{9}{15}\) days = \(x\) lunar days: 30 days gives for \(x\) the number of
9764\frac{4}{11}11, which is equivalent to 9764\frac{4}{11}11. Vide p. 24.
1. 23 (Schram).

P. 22, l. 17.—Read 22\textsuperscript{nd} instead of 23\textsuperscript{nd} (Schram).

P. 23. Padamāsa.—This seems to be an old mistake which has crept into the Arabic manuscripts of the works of Alfazārī and Ya'kūb. Cf. the author’s “Chronology” (English edition), p. 15.

P. 27.—The rule given in the first fifteen lines of this page is completely erroneous, and consequently the example calculated after this rule is so too. The right method would be the following:—“The complete years are multiplied by 12; to the product are added the months which have elapsed of the current year. The sum represents the partial solar months. You write down the number in two places; in the one place you multiply it by 5311, i.e. the number which represents the universal adhimāsa months. The product you divide by 172,800, i.e. the number which represents the universal solar months. The quotient you get, as far as it contains complete months, is added to the number in the second place, and the sum so obtained is multiplied by 30; to the product are added the days which have elapsed of the current month. The sum represents the candrāhargana, i.e. the sum of the partial lunar days.” These two proceedings would be identical, if we were not to omit fractions; but as an adhimāsa month is only intercalated when it is complete, we must first determine the number of adhimāsa months, and, omitting the fractions, change them to days; whilst when we multiply beforehand by 30, the fractions of the adhimāsa months are also multiplied, which is not correct. This is at once seen in the example which he works out after this rule, and we wonder that Alberuni himself did not see it. He is calculating the aharganas for the beginning of a year, consequently also for the beginning of a month, and, notwithstanding, he is not at all surprised to find (p. 30) 28 days and 51 minutes of the month already passed.

The adhimāsa days are nothing else than adhimāsa months converted into days. As the number of the adhi-
mâsa months must be a whole, so the number of the adhimâsa days must be divisible by 30. Accordingly, the number quoted, p. 29, l. 30, not being divisible by 30, is at once recognised as erroneous, and it is astonishing when he says in the following lines, "If, in multiplying and dividing, we had used the months, we should have found the adhimâsa months and multiplied by 30, they would be equal to the here-mentioned number of adhimâsa days." In this case certainly the number ought to be divisible by 30. Perhaps he would have found the fault, if not, by a strange coincidence, the difference between the true value and the false one had been exactly 28 days or four complete weeks, so that though the number considered is an erroneous one, yet he finds, p. 30, l. 9, the right week-day.

Alberuni finds, p. 29, l. 2, as the sum of days from the beginning of the kalpa to the seventh manvantara 676,610,573,760. Further, he finds, l. 7, that from the beginning of the seventh manvantara till the beginning of the present caturyuga there have elapsed 42,603,744,150 days, and, l. 12, that till the beginning of the kaliyuga there have elapsed 1,420,124,805 days of the present caturyuga. Adding these numbers, we find that the sum of days elapsed from the beginning of the kalpa to that of the caturyuga is 720,634,442,715; but as he finds, p. 30, l. 5, that from the same epoch to the gauge-date there have elapsed 720,635,951,963 days, so the gauge-date would be 1,509,248 days after the beginning of the kaliyuga. Now we know that the gauge-date is 25th February 1031 (see p. 2, l. 17, and note), or the day 2,097,686 of the Julian period, whilst the first day of the kaliyuga, as is generally known, coincides with the 18th February 3102 before Christ or with the day 588,466 of the Julian period, so that the difference of the two dates is 1,509,220, and not 1,509,248 days.

To this result we shall also come when working out Alberuni's example after the method stated in the beginning of this note. Instead of p. 29, l. 16, we should then have: the years which have elapsed of the kalpa up to that year are 1,972,948,132. Multiplying them by 12, we get as the number of their months 23,675,377,584. In the date which we have adopted as gauge-year there is
no month, but only complete years; therefore we have nothing to add to this number. It represents the partial solar months. We multiply it by $5311$ and divide the product by $172,800$; the quotient $727,661,633\frac{3}{5}$ represents the adhimâsa months. Omitting the fractions, we add $727,661,633$ to the partial solar months $23,675,377,584$, and get $24,403,039,217$ as the partial lunar months. By multiplying this number by $30$ we get days, viz., $732,091,176,510$. As there are no days in the normal date, we have no days to add to this number. Multiplying it by $55,739$ and dividing the product by $3,562,220$, we get the partial ūnarâtra days, viz., $11,455,224,575\frac{3}{7}$ This sum of days without the fraction is subtracted from the partial lunar days, and the remainder, $720,635,951,935$, represents the number of the civil days of our gauge-date. Dividing it by $7$, we get as remainder $4$, which means that the last of these days is a Wednesday. Therefore the Indian year commences with a Thursday. The difference between $720,635,951,935$ and the beginning of the kâliyuga $720,634,442,715$ is, as it ought to be, $1,509,220$ days (Schram).

In the beginning of chap. li., in the Arabic text, ٣٨, it seems necessary to write ٥٤٨ and ٥٤٨ instead of ٥٤٨ and ٥٤٨.

P. 29, l. 10. Thursday.—The Arabic manuscript has Tuesday.

P. 30, l. 10–17.—This ought to run as follows:—We have found above $727,661,633\frac{3}{5}$ for the adhimâsa months; the wholes represent the number of the adhimâsas which have elapsed, viz., $727,661,633$, whilst the fraction is the time which has already elapsed of the current adhimâsa month. By multiplying this fraction by $30$ we get it expressed in days, viz., $34\frac{3}{7}$ days, or $28$ days $51$ minutes $30$ seconds, so that the current adhimâsa month wants only $1$ day $8$ minutes $30$ seconds more to become a complete month (Schram).

P. 31, l. 19.—The number $1,203,783,270$ is found by adding the $30 \times 1,196,525$ or $35,895,750$ adhimâsa days to the $1,167,887,520$ solar days (Schram).
P. 31, l. 24.—The number of days from the beginning of the caturyuga to the gauge-date is here found by Pulisa’s method to be 1,184,947,570, whilst p. 33, l. 16, the number of days from the beginning of the caturyuga to that of the kaliyuga is found to be 1,183,438,350. The difference between both numbers is (as it ought to be) 1,509,220 days (Schram).

P. 33, l. 24.—The method of Áryabhaṭa is the same as that given before, only the numbers by which we are to multiply and to divide, are different according to his system, which supposes a different number of revolutions in a kalpa. According to Áryabhaṭa the elder, a caturyuga has 1,577,917,500 days (see vol. i. p. 370, l. 28). As to the revolutions of sun and moon, they seem to be the same as given by Pulisa. The tables, pages 16 and 17, are not quite correct in this, as they give, for instance, for the revolutions of the moon’s node and apsis the 1000th part of their revolutions in a kalpa, whilst in vol. i: p. 370, l. 16, it is said that, according to Pulisa and Áryabhaṭa, the kalpa has 1008 caturyugas. But p. 19, l. 15, the numbers 4,320,000 for the sun and 57,753,336 for the moon are given as possibly belonging to the theory of Áryabhaṭa. The same numbers are cited by Bentley in his “Historical View of the Hindu Astronomy,” London, 1825, p. 179, as belonging to the system of the so-called spurious Árya Siddhanta. It is doubtless the same system, for if we compare the number of days between the beginning of the kalpa and that of the kaliyuga, which Bentley states in the above-cited book, p. 181, to be 725,447,570,625, with the same sum quoted by Alberuni, p. 33, l. 29, there can scarcely be a doubt as to the identity of both systems, especially as this number 725,447,570,625 is a curious one, giving Thursday for the first day of the kalpa, whilst the other systems give Sunday for this date. Of this book Bentley says, p. 183: “It would be needless to waste any more time in going over its contents; what has been shown must be perfectly sufficient to convince any man of common sense of its being a downright modern forgery;” and p. 190, “The spurious Brahma Siddhanta, together with the spurious Árya Siddhanta, are doubtless the productions of the last century at farthest.” Perhaps
he would have chosen more reserved expressions, if he had known that this "production of the last century" was already cited by Alberuni.

When we adopt these numbers for a caturyuga, i.e. 1,577,917,500 civil days, 4,320,000 revolutions of the sun and 57,753,336 revolutions of the moon, and consequently 53,433,336 lunar months, we find the numbers belonging to a yuga by dividing the above numbers by four, as in this system the four yugas are of equal length. Thus we get for a yuga 394,479,375 civil days, 1,080,000 solar years, and consequently 12,960,000 solar months, and 388,800,000 solar days, 13,358,334 lunar months, 400,750,020 lunar days, 398,334 adhirāsa months, and 6,270,645 tīnārātra days. To find the number 725,449,079,845 mentioned, p. 33, l. 31, as the sum of days between the beginning of the kalpa and the gauge-date, we are to proceed as follows:—From the beginning of the kaliyuga to our gauge-date there have elapsed 4132 years, which multiplied by 12 give 49,584 as the partial solar months. This number multiplied by the universal adhirāsa months 398,334, and divided by the universal solar months 12,960,000, gives 1523 445 88 as the number of adhirāsa months. This number, without the fraction added to the solar months 49,584, gives 51,107 as the number of the partial lunar months, which multiplied by 30 gives 1,533,210 as the number of the partial lunar days. This number multiplied by the universal tīnārātra days 6,270,645 and divided by the universal lunar days 400,750,020 gives 23,990 21 7 1 4 as the sum of the partial tīnārātra days; and 23,990 subtracted from the partial lunar days 1,533,210 gives 1,509,220 as the civil days elapsed of the kaliyuga till the gauge-date, identical with the number found in note to p. 27. These 1,509,220 days added to the 725,447,570,625 days which separate the beginning of the kalpa and the kaliyuga, give the number of 725,449,079,845 days cited p. 33, l. 31. Finally, the number of days elapsed of Brahman's life before the present kalpa, is got by multiplying the number of days in a kalpa, i.e. 1,590,540,840,000 (see page 370, vol. i.) by 6068, the number of the kalpas elapsed before the present one (Schram).

P. 34, l. 32.—There is here the same fault as that which
led Alberuni to a false result, p. 27. The multiplication by 30 must be made after dropping the fraction of the adhimâsa months, not before (Schram).

P. 36, l. 1.—The lacuna must have contained a phrase like this:—"In three different places; they multiply the number in the lowest place by 77, and divide the product by 69,120." This follows clearly from the explanation which he gives in the following page (Schram).

P. 36, l. 9.—Read lunar instead of solar, in the Arabic (ثلث, 7, last word), شمسية instead of شمسية.

P. 36, l. 10.—The expression is a very concise one, so that it is not quite clear what is meant (l. 14) by the "middle number."—It is to be understood in the following manner: "This number of the partial lunar days is written down in two different places, one under the other. The one of these is "in the uppermost place" (l. 17); they multiply the lower number by 11, and write the product under it. Then they divide it, i.e. the product, by 403,963, and add the quotient to the middle number, i.e. to the product of eleven times the partial lunar days (Schram).

P. 36, l. 26.—A certain number of months $A$ is to be divided by $65\frac{1188}{511933}$. If we wish to get the same result by dividing only by 65, we must subtract from $A$ a certain number $X$ which is to be determined by the equation

$$\frac{A}{65\frac{1188}{511933}} = A - X$$

This equation gives for $X$ the value $X = A\left(\frac{1188}{511933}\right)$, or, reduced, $X = A\left(\frac{1188}{4933}\right)$, or at last $X = A\left(\frac{77}{593}\right)$. The equation $X = A\left(\frac{1188}{511933}\right)$ can also be written in the form $65\frac{1188}{511933} : \frac{1188}{511933} = A : X$, that is, as Alberuni states it (l. 30), "the whole divisor stands in the same relation to its fractions as the divided number to the subtracted portion" (Schram).

P. 36, l. 33.—Alberuni has not made the calculation given vol. ii.
above in a general way, but he has made it only for a special case, for the gauge-date. He finds the fraction \( \frac{77}{11} \), which he would find for every other date, as this fraction is independent of the number \( A \) (Schram).

P. 37, l. 26.—Here again a certain number of tinaratra days \( A \) is to be divided by \( 63\frac{31}{33} \). If we wish to get the same result by dividing only by \( 63\frac{1}{11} \), or, which is the same, by \( \frac{702}{11} \), we must add to \( A \) a certain number \( X \), which is determined by the equation

\[
\frac{A + X}{\frac{702}{11}} = \frac{A}{63\frac{31}{33}} \quad \text{or} \quad A + X = A \left( \frac{703}{11 \times 63\frac{31}{33}} \right) = A \left( \frac{703 - 11 \times 63\frac{31}{33}}{11 \times 63\frac{31}{33}} \right) = A \left( \frac{703 - 702}{702} \right) = A \left( \frac{1}{702} \right)
\]

or at last, dividing numerator and denominator by 97, we find

\[ X = \frac{A}{403,960,397}. \]

The \( \frac{97}{97} \) are neglected (see p. 38, l. 9) (Schram).

P. 38, l. 25.—The Arabic manuscript has 77,139, instead of 7739, as Dr. Schram demands; v. p. 39, l. 7, and p. 40, l. 8.

P. 39, l. 20.—Here he grants that the 28 days which we get over 727,661,633 months are to be reckoned after the beginning of the month Caitra, so that the result found, p. 29, l. 30, agrees with the 28th, not with the first Caitra (Schram).

P. 39, l. 24.—The middle number was multiplied by \( \frac{25}{28} \); a solar year has \( 365\frac{1}{4} \) days (l. 36), or 52 weeks \( 1 \) day and \( \frac{1}{4} \) of a day. By adding the product of the number of years multiplied by \( \frac{25}{28} \) to this number itself, we get the sum of days by which these years exceed whole weeks. The rest of the calculation is sufficiently explained by Alberuni himself (Schram).

P. 41, l. 19.—This is the same case as p. 36, only the numbers are a little different. If \( A \) is the number of months to be divided by \( 32\frac{3}{8} \), and we wish to subtract a number from \( A \) so as to get the same result by
dividing the difference by 32 only, we have the equation
\[ \frac{A}{32} = \frac{A - X}{32} \]
which gives for \( X \) the value
\[ A \left( \frac{35552}{2160000} \right) \text{ or } X = A \left( \frac{1111}{67500} \right). \]
Alberuni has again made the calculation for a special case, the gauge-date, and found the same fraction (Schram).

P. 41, l. 20.—"This number of days," viz., the number of solar days corresponding to the given date (Schram).

P. 41, l. 33.—The MS. has 974 instead of 976.

P. 42, l. 3.—The number of solar days, 1,555,222,000, is here taken as divisor instead of the number of adhimāsa months, 1,593,336. The fraction ought to be 976,104,064
\[ = 976_{\text{II}33333} \text{, the common divisor 24 (Schram).} \]

P. 42, l. 6.—Alberuni does not seem to have understood Pulisa's calculation which is correct, although there seems to be a lacuna in its explanation. According to Pulisa's theory, there are in a caturyuga 1,555,200,000 solar days and 1,593,336 adhimāsa months. Dividing the first number by the second, we get as the time within which an adhimāsa month sums up 976,104,064 days. So one would get the number of adhimāsa months by dividing the given number of solar days by the number 976,104,064; but Pulisa prefers not to reckon with the fraction, so he diminishes the number of given days by a certain amount and divides only by 976. The number which is to be subtracted from the given days is easily found by the following equation:

Let \( D \) be the number of given solar days; we then have
\[ \frac{D}{976_{\text{II}33333}} = \frac{D - X}{976} \text{ or } X = D \left( \frac{104064}{976_{\text{II}33333}} \right) \text{ or } X = D \left( \frac{104064}{105250000} \right) \]
\[ \text{or } X = D \left( \frac{104064}{105250000} \right). \]
Now 384 is a common divisor to 104,064 and the divisor 1,555,200,000. So we get \( X = D_{\frac{291}{105250000}} \), just as Pulisa finds it (Schram).
P. 42, l. 22.—Not only is it not "quite impossible that this number should, in this part of the calculation, be used as a divisor," but it needs must be used as a divisor. This we see at once when, instead of working out the calculation with special numbers, we make it algebraically. Let \( S \) be the number of solar days in a caturyaga, and \( A \) the number of adhimāsa months in a caturyaga. Then the number of days within which one adhimāsa month sums up, will be found by dividing \( S \) by \( A \). By this division we shall get wholes and a fraction; let the wholes be represented by \( Q \) and the numerator of the fraction by \( R \).

We then have \( \frac{S}{A} = Q + \frac{R}{A} \) or \( S = AQ + R \). Now if, the given number of solar days being \( D \), we have to divide \( D \) by \( Q + \frac{R}{A} \) to get the number of adhimāsa months, but as we wish to divide by \( Q \) alone, we must subtract from \( D \) a number \( X \), which will be found by the equation

\[
\frac{D}{Q + \frac{R}{A}} = \frac{D - X}{Q} \text{ or } X = D \left( \frac{R}{AQ + R} \right)
\]

As \( AQ + R \) is equal to \( S \), we have \( X = D \frac{R}{S} \), where \( S \) is the number of solar days in a caturyaga, which must necessarily be a divisor in this part of the calculation (Schram).

P. 42, l. 31.—As one ānarātra day sums up in 63\(\frac{1}{4}\) lunar days (see p. 37, l. 17), we have again the equation

\[
\frac{L}{63\frac{1}{4}} = \frac{L - X}{63} \text{ or } X = L \left( \frac{\frac{1}{4}}{63\frac{1}{4}} \right) \text{ or } X = L \left( \frac{4}{251} \right)
\]

where \( L \) represents the number of the given lunar days.

P. 44, l. 1.—The number 720,635,951,963 is not correct, as we have seen in note to p. 27. It is too great by 28 days. But the number of adhimāsa days, 21,829,849,018 (l. 10), is also 28 days too great. So the difference is again correct. There is the same fault as at p. 27. The calculation ought to run as follows:—The partial civil days which have elapsed up to our gauge-date are 720,635,951,935. This number is given, and what we
want to find is how many Indian years and months are equal to this sum of days. First we multiply the number by 55,739 and divide the product by 3,506,481; the quotient is 11,455,224,575\(\frac{1}{111,111}\) ñunarâtra days. We add 11,455,224,575 to the civil days; the sum is 732,091,176,510 lunar days. Dividing this number by 30, we get as quotient 24,403,039,217 lunar months (and no fraction; so we see that the date in question consists of a number of months only, or, what is the same, that the date corresponds to the beginning of a month). Multiplying the lunar months by 5311 and dividing the product by 178,111, we get 727,661,633\(\frac{1}{111,111}\) adhimâsa months; 727,661,633 adhimâsa months subtracted from the 24,403,039,217 lunar months give 23,675,377,584 solar months, which divided by 12 give 1,972,948,132 years and no fraction. So we find the given date corresponding not only to the beginning of a month, but also to that of a year. We find the same number of years of which the gauge-date consists (see p. 29, l. 17) (Schram).

P. 45, l. 12.—This rule must indeed be based on some complete misunderstanding, for it is absolutely erroneous, as Alberuni rightly remarks (Schram).

P. 46, l. 1.—If we calculate from the beginning of the kalpa or the caturyuga, there are in the epoch neither fractions of the adhimâsa months nor of ñunarâtra days; but as the great number of days embraced by such long periods makes the calculation intolerable, the methods set forth in this chapter start neither from the beginning of the kalpa nor from that of the caturyuga, but from dates chosen arbitrarily and nearer to the time for which they are to be employed. As such epochs are not free from fractions of the adhimâsa months and ñunarâtra days, these fractions must be taken into account (Schram).

P. 46, l. 27.—The numbers employed here do not belong to Brahmagupta's, but to Pulisa's system. The year taken as epoch is the year 587 Śakakāla. As we have seen, p. 31, ll. 8–10, that in the moment of the beginning of our gauge-date or of the year Śakakāla 953, there have elapsed 3,244,132 years of the caturyuga, there must have elapsed
3,243,766 years of the caturyaga till the beginning of the year 587 Şakakāla. We must now first calculate the adhimāsa months and fañarātra days for this epoch. After Pulisa's method (p. 41, l. 29), we have: 3,243,766 years are equal to 38,925,192 solar months or 1,167,755,760 solar days. This number multiplied by 271 and divided by 4,050,000 gives 78,138$\frac{3}{4}$ days. As here the nearest number is to be taken, we get 78,139, which, subtracted from 1,167,755,760, gives 1,167,677,621. This latter number divided by 976 gives as the number of adhimāsa months 1,196,391$\frac{4}{7}$. Now 1,196,391 adhimāsa months are equal to 35,891,730 adhimāsa days, which, added to 1,167,677,620 solar days, give 1,203,647,490 lunar days. According to Pulisa's theory (see p. 26, l. 9), there are in a caturyaga 1,603,000,080 lunar and 25,082,280 fañarātra days; so one fañarātra day sums up in $63\frac{3}{4}$ lunar days. Therefore we should have to divide the given number of lunar days $L$ by $63\frac{3}{4}$, but we prefer to subtract from $L$ a certain number $X$, and to divide the rest by $63\frac{3}{4}$ or $\frac{685}{11}$. The number $X$ will be given by the equation $\frac{L}{63\frac{3}{4}} = \frac{L - X}{X}$. This equation gives for $X$ the value $X = \left(1 - \frac{703}{703 + \frac{49}{71}}\right)L$ or $X = \left(1 - \frac{439}{4898058}\right)L$ or $X = \left(1 - \frac{1}{11573}\right)L$.

Now $L$ being equal to 1,203,647,490 lunar days, $\frac{11}{11} L$ will be equal to 13,240,122,390 lunar days; this number divided by 111,573 gives 118,667$\frac{81}{111}$ days. Taking the nearest number, we subtract 118,668 from 13,240,122,390 and get 13,240,003,722, which divided by 703 gives 18,833,575$\frac{99}{100}$ as the number of fañarātra days. This added to the 1,203,647,490 lunar days gives for the date of our epoch the number of civil days 1,184,813,915.

This number divided by 7 gives 5 as remainder. Now the last day before the present caturyaga was a Monday (see p. 33, l. 11), therefore the last day before our epoch is a Saturday, and any number of days elapsed since that epoch if divided by 7 will indicate by the remainder, the week-day counted from Sunday as 1, as it is said, p. 47, l. 19. Now the whole method is easily recognised.
as thoroughly correct. Instead of multiplying the partial solar days by \(\frac{11}{10000}\), we multiply them by \(\frac{11}{11}\), which is sufficiently correct, as \(\frac{11}{10000}\) is equal to \(\frac{1}{1494417}\).

As besides the whole adhimāsa months there is yet a fraction of \(\frac{1}{6}\) adhimāsa months in our epoch, we add 5 before dividing by 976. The calculation of the ānarātra days has already been explained; but as in our epoch besides the whole ānarātra days there is still a fraction of \(\frac{11}{11}\) ānarātra days, we must add 497 before dividing by 703. The whole proceeding is thus explained (Schram).

P. 48, l. 11.—The calculation has been made for the complete years elapsed before our gauge-date. So we get the week-day of the last day before the first Caitra of the gauge-date, and if this is a Wednesday, the first Caitra itself is a Thursday; cf. p. 30, l. 9.

The first day of this epoch corresponds to the day 1,964,031 of the Julian period. Adding 133,655 to 1,964,031, we have for the first Caitra 953 the day 2,097,686 of the Julian period, as it ought to be (Schram).

P. 48, l. 21.—The 18th Isandârmadh of Yazdajird 399 corresponds in fact to Wednesday, 24th February 1031, the day before the first Caitra 953 Śakakâla (see note to p. 2, l. 17) (Schram).

P. 49, l. 22. By six years.—The Arabic manuscript has seven instead of six.

P. 50, l. 1.—The method here employed is based on Pulisa's theory. According to this theory, the solar days must be divided by 976 \(\frac{48}{50}\) to get the adhimāsa months. Now 976 \(\frac{48}{50}\) with sufficient accuracy is equal to 976 \(\frac{2}{3}\) or \(\frac{29282}{30}\).

If \(S\) represents the number of solar months, the solar days or 30 \(S\) are to be divided by \(\frac{29282}{30}\), or, what is the same, 900 \(S\) must be divided by 29282.

To get the ānarātra days, the lunar days must be divided by 63 \(\frac{48}{50}\) (see note to p. 46, l. 27). Now 63 \(\frac{48}{50}\) is equal to \(\frac{703}{11}\), or with sufficient accuracy \(\frac{703}{11}\).
or at least equal to \(\frac{21002}{2900}\). So the multiplications and divisions of this method are explained.

The constant numbers which are to be added, are inherent to the epoch. The year 888 Šakakāla corresponds to the year 3,244,067 of the caturyuga; 3,244,067 years are equal to 38,928,804 solar months, or 1,167,864,120 solar days. These solar months multiplied by 66,389 and divided by 2,160,000 give 1,196,502.\(\frac{8888}{10000}\) adhimāsa months, or 35,895,060 adhimāsa days. This added to the 1,167,864,120 solar days gives 1,203,759,180 lunar days. Eleven times this number is equal to 13,241,350,980; this latter number divided by 111,573 gives 118,678,\(\frac{1616}{10000}\), or the nearest number 118,679. Subtracting this from 13,241,350,980, the remainder is 13,241,232,301, which being divided by 703, gives 18,835.323\(\frac{552}{1000}\) ūnarātra days; these days subtracted from the lunar days give for the number of civil days 1,184,923,857. Dividing this last number by 7, we get the remainder 5; and as the last day before the present caturyuga was a Monday (see p. 33, l. 11), the last day before the epoch here adopted is a Saturday, so that any number of days elapsed since that epoch, if divided by 7, will indicate by the remainder the week-day counted from Sunday as 1. The first day of...this epoch corresponds to the day 2,073,973 of the Julian period. We have found in our epoch the fraction of adhimāsa month 48.\(\frac{8888}{10000}\), which is equal to \(\frac{6601}{29282}\) or very nearly \(\frac{661}{295}\) adhimāsa month, so we must add 661 before dividing by 29282.

The fraction of ūnarātra days \(\frac{552}{1000}\) is equal to \(\frac{69,601}{210902}\) or nearly to \(\frac{69601}{21091}\). Therefore we must add 69,601 before dividing by 210,902. Alberuni has, instead of this number 69,601, the number 64,106, 4 instead of 9, and the last three numbers reversed (Schram).

P. 50, l. 35.—We had 780 months; adding thereto the 23 adhimāsa months, we have 803 months, which being multiplied by 30 give 24090, and not 24060 days. All the following faults are the consequences of this one (Schram).

P. 51, l. 2.—It ought to be "adding thereto 69,601, we
get the sum 79,566,601. By dividing it by 210,902, we get the quotient 377, i.e. ūnarātra days, and a remainder of \( \frac{8}{15} \), i.e. the avamasā. (In the Arabic text, p. 96, 17, the reading of the MS. ought not to have been altered.) The correct result is 23,713 civil days. If we divide this number by 7, we find the remainder 4, which shows again that the last day before our gauge-date is a Wednesday. By adding 23,713 to 2,073,973, we get for the first Cātra 953 the day 2,097,686 of the Julian period, as it ought to be (Śrāma).


P. 51, I. 9.—This method works with numbers much less accurate than the preceding ones. It is assumed that one adhimāsa month sums up in 32\(\frac{2}{3}\) solar months. So the solar months are divided by 32\(\frac{2}{3}\) or by \(\frac{228}{7}\), or, what is the same, they are multiplied by \(\frac{7}{228}\). For the time within which an ūnarātra day sums up, there is simply taken 63\(\frac{3}{5}\), and the lunar days are divided by 63\(\frac{3}{5}\) or 7\(\frac{3}{19}\), or, what is the same, multiplied by \(\frac{19}{5}\). The epoch corresponds to the year 427 Śakakāla, or the year 3,243,606 of the caturyuğa. This number of years is equal to 38,923,272 solar months, which, multiplied by 66,389 and divided by 2,160,000, give 1,196,332 adhimāsa months. The author has taken 1,196,322 adhimāsa months and neglected the little fraction \(\frac{1}{980}\), so that he has no fractions of adhimāsa months. These 1,196,332 adhimāsa months added to the 38,923,272 solar months give 40,119,604 lunar months or 1,203,588,120 lunar days. Multiplying by 11, we have 13,239,469,320, which divided by 111,573 gives 118,666,648\(\frac{1}{11}\) or 118,662. Subtracting this from 13,239,469,320, we have 13,239,350,658, which divided by 703 gives 18,832,646\(\frac{1}{29}\) for the number of ūnarātra days. So the fraction of ūnarātra days is \(\frac{2}{29}\), very near to that adopted by the author of the method, viz., \(\frac{10}{14}\). By subtracting the ūnarātra days from the lunar days we get as the number of civil days 1,184,755,474, which is divisible by 7. So, as the last day before the caturyuğa was Monday, the last day before this epoch is also Monday, and the number of days elapsed since this epoch if divided by 7, will give a remainder which indicates the week-day,
counting Tuesday as 1. The first day of this epoch corresponds to the day 1,905,590 of the Julian period (Schram).

P. 51, l. 24.—It is easily understood why this method is called that of the Siddhânta of the Greeks. It is assumed that an adhimâsa month sums up in \(32\frac{1}{7}\) or \(32\frac{2}{7}\) solar months. Now \(32\frac{2}{7}\) solar months are equal to \(1\frac{1}{6}\) solar years. Therefore this method is apparently an application of the cycle of nineteen years of the Greeks (Schram).

P. 52, l. 2.—32 months 17 days 8 ghatî and 34 cashaka are only another expression for \(32\frac{5}{7}\) months (Schram).

P. 52, l. 10.—The number of civil days is 192096; dividing by 7, we have as remainder 2. As in this method (see note to p. 51, l. 9) Tuesday is to be reckoned as 1, this gives for the last day before our gauge-date Wednesday. Adding 192,096 to 1,905,590, we get as the first Caitra 953 the day 2,097,686 of the Julian period, as it ought to be (Schram).

P. 52, l. 20. Al-harkâm.—This book is mentioned only in this passage. The author calls it a canon, \(\text{i.e.}\) a collection of astronomical, chronological, and astrological tables and calculations. Whether it was an original composition in Arabic or translated from Sanskrit, and from what original, we do not learn from him. The word seems to be an Arabic rendering of \(\text{aharjana}.\) Alberuni quotes from this book the computation of an era the epoch of which falls 40,081 days later than that of the Persian era, and compares it with the gauge-date (p. 53).

P. 52, l. 22.—If the epoch should fall 40,081 days after that of the era Yazdajird, it would fall on the first Caitra of the year 664 \(\text{Sakakâla};\) but this is not the case. The first of Sha'\(\text{bân}\) of the year 197 coincides with the beginning of Vai\(\text{sâkha} 735.\) As there are 72 years to be subtracted, we should come to Vai\(\text{sâkha} 663,\) and to begin with the beginning of a year, the epoch must be postponed to Caitra 664. But this is of no importance, as we shall see that Alberuni altogether misunderstood the method here given (Schram).
P. 52, l. 24.—These two dates do not agree to a day. The first Fetrwerdînmînâ Yazdajîrd coincides with 16th June 632; 40,081 days later was Monday, 12th March 742, whilst the 21st Daimâh of the year 110 of Yazdajîrd corresponds to Sunday, 11th March 742. But as the date itself is erroneous, this is of no importance (Schräm).

P. 52, l. 27.—As the numbers which form multiplications and divisions in this method are identical with those of the Pañca Siddhântikâ (p. 51), we can reckon the constants by the directions there given. The epoch of the method of Al-hârkan is the beginning of Sha‘bân of the year 197. But this date corresponds to the beginning of Vaiśakha 735 Śakakâla. So we should have for this date the following calculation:—Subtracting 427 from 735 years and 1 month, we get 308 years 1 month, or 3697 months; 3697 multiplied by 7 and divided by 228 gives for the number of adhimâsa months 113
\[\frac{116}{228}\]; the 113 adhimâsa months added to the 3697 solar months give 3810 lunar months or 114,300 lunar days. This number multiplied by 11 is 1,257,300; we add 514, which gives us 1,257,814; this divided by 703 gives for the number of ūnarâtra days 178\[\frac{1}{703}\]. So we should have all the numbers wanted for our epoch if, in fact, this epoch were the true epoch. But we have to add 864 months to the interval. Therefore these 864 months, which must always be added, must first be subtracted from the epoch, so that this latter is thrown back by 72 years. Now 72 years or 864 solar months multiplied by 7 and divided by 228 give the number of 26\[\frac{58}{703}\] adhimâsa months. These together with the 864 solar months are 890 lunar months or 26,700 lunar days, which multiplied by 11 and divided by 703 give 417\[\frac{44}{703}\] ūnarâtra days. So we have to subtract from the numbers first found 26\[\frac{58}{703}\] adhimâsa months and 417\[\frac{44}{703}\] ūnarâtra days. The number of adhimâsa months inherent to our true epoch will then be 113\[\frac{116}{228}\] - 26\[\frac{58}{703}\] = 86\[\frac{58}{228}\], or with sufficient accuracy 87 without a fraction, and the number of ūnarâtra days 178\[\frac{1}{703}\] - 417\[\frac{44}{703}\] = 137\[\frac{58}{703}\]. Therefore no fraction is to be added to the adhimâsa months, whilst to the ūnarâtra days there must be added \(\frac{2}{703}\), or nearly \(\frac{1118}{703}\). Therefore we must add 28 (not 38) before multiplying by \(\frac{1}{703}\). The 114,300 lunar
days of the first epoch diminished by the 26,700 lunar
days of the 72 years, give 87,600 lunar days. Subtract-
ing therefrom 1371 anarātra days, we have 86,229 civil
days, which being divided by 7 give as remainder 3. So
the last day before this epoch is Thursday, and the number
of days elapsed since the epoch of this method, if divided
by 7, will give a remainder indicating the week-day, count-
ing Friday as 1. The first day of this epoch corresponds
to the day 1,991,819 of the Julian period (Schram).

P. 53, l. 1.—It must be 28, not 38 (see preceding note)
(Schram).

P. 53, l. 6.—We must add 1, if we wish to have the week-
day of the date itself, not that of the last day before it.

P. 53, l. 8.—Here Friday is considered as the first day
of the week, not, as in the Indian books, Sunday. This
ought to have been remarked (Schram).

P. 53, l. 9.—Alberuni's notes to this method of Al-
harkan are perhaps the weakest part of his work. His
very first remark shows a complete misunderstanding of
the whole calculation. The method is correct, for the
months of the seventy-two years with which it begins are
solar. If, as Alberuni would have them, they were lunar,
and the rest of the months, as he understands it, were lunar
too, then the calculation would simply be nonsense; for
finding adhimāsa months is nothing else than finding the
number which we must add to convert solar months into
lunar ones. But when the months are already lunar, how
can one add anything to them to make them once more
lunar? (Schram).

P. 53, l. 15.—The example he works out is as erroneous
as the remarks on the method itself. It must be clear to
anybody who examines the method given on p. 52, that by
the words (l. 29), "Add thereto the months which have
elapsed between the first of Sha'bān of the year 197 and
the first of the month in which you happen to be," there
can only be meant solar months. The author fixed the
initial epoch in his calendar by saying "1 Sha'bān 197,"
instead of fixing it in the Indian calendar by saying
“first Vaisakha 735.” This accidental circumstance, which is of no consequence, induced Alberuni to think that he was to take the interval in lunar months, as the Arabic calendar has only lunar months, and he did not notice that lunar months in this part of the calculation would be absolutely impossible. He takes, in fact, in the example, the interval in lunar months, for there are 2695 lunar months between the first Sha‘bân 197 and first Rabi’ I. 422, and to these 2695 lunar months he adds the 364 months which he knows to be solar. Then he changes all these mingled months, of which the greatest part are already lunar, to lunar ones, as if they all were solar, and at last he wonders that the result is nonsense, and tries to amend the method. The only fault in the matter is that he did not understand the method.

If we wish to exemplify the method of the canon Alharkan in the case of our gauge-date, i.e. the first Caitra 953 Śakakāla, we must proceed as follows:—Subtracting from 953 years 735 years 1 month, we get as interval 217 years 11 months or 2615 solar months; adding thereto 864 solar months, we have 3479 solar months. This multiplied by 7 and divided by 228 gives for the number of adhimāsa months 106⅔; adding the 106 adhimāsa months to the 3479 solar months, we get 3585 lunar months, or 107,550 lunar days. We add 28, and multiplying 107,578 by 11, we have 1,183,358, which number divided by 703 gives the number 1683⅔ for the śnarāṭra days. Subtracting the 1683 śnarāṭra days from the 107,550 lunar days, we have 105,867 civil days. We add 1 in order to get the week-day of the first Caitra 953, and dividing by 7, we get as remainder 7. And as here Friday is considered as 1, so 7 corresponds to Thursday, and the first Caitra 953 is found to be Thursday. By adding 105,867 to 1,991,819 we have for the first Caitra of the year 953 the day 2,097,686 of the Julian period, as it ought to be (Schram).

P. 53, l. 33.—The emendation is as erroneous as the example was. The 25,958 days are counted from the epoch falling 40,081 days after that of Yazdajird to the first Sha‘bân 197. But 25,958 days are equal to 879 Arabic months, or 73 years and 3 months. Further, he
takes again the interval in lunar months, so that now in
the amended method he has nothing but lunar months,
which he changes to lunar months as if they were solar.
So he gets a number which is, of course, absolutely erro-
rous, but he thinks it to be correct, for in the last instance
he commits a new fault by subtracting 1 instead of adding
it. And so by an accidental combination of different faults
he finds by chance a week-day which agrees with that of
the day before our gauge-date (Schram).

P. 54, l. 12.—As the multiplications and divisions of
this method have already been explained in the note to
pp. 36 and 37, we have here to account for the constant
numbers only which are inherent to the epoch. The
epoch is 854 Šakakāla, which corresponds to the year
1,972,948,033 of the kalpa. Multiplying 1,972,948,033
by 12, we find 23,675,376,396 solar months, which mul-
tiplied by 1,593,300,000, the adhimāsa months of a kalpa,
and divided by 51,840,000,000, the solar months of a kalpa,
give the quotient 727,661,597₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄₄沙特阿拉伯
The first day of this epoch coincides with the day 2,061,541 of the Julian period (Schram).

P. 55, l. 5.—This method consists in finding first the difference of the mean longitude of sun and moon. The numbers are Pulisa's. There are in a caturyuga 4,320,000 revolutions of the sun, and 57,753,336 revolutions of the moon. The difference, 53,433,336, is the number of lunar months. In every lunar month the moon gains one revolution or 360 degrees over the sun. Dividing 53,433,336 by the solar years 4,320,000, we find as the number of lunar months belonging to one solar year $12\frac{13}{8}$, or $12\frac{13}{8}$ revolutions. So in every solar year the moon gains over the sun $12\frac{13}{8}$ revolutions.

Omitting the whole revolutions which have no interest, the moon gains over the sun $12\frac{13}{8} \times \frac{360}{3600}$ degrees, or, what is the same, 132\frac{17}{80} degrees. Now 17\frac{7}{80} degrees are equal to 46\frac{5}{10} minutes, or to 46\frac{5}{10} minutes. So the moon gains over the sun in every solar year 132 degrees 46\frac{5}{10} minutes. By multiplying the number of years by 132 degrees 46\frac{5}{10} minutes, we find the number of degrees which the moon has gained in the given interval over the sun. Now if in the beginning of this epoch sun and moon had been together, this would be the difference of the mean longitude of sun and moon. But as this was only in the beginning of the caturyuga, but not at the moment of our epoch, there is an initial difference between the longitudes of sun and moon which must be added. Our epoch, or the year 821 Šakakāla, corresponds to the year 3,244,000 of the caturyuga. Multiplying 3,244,000 by the number of lunar months 53,433,336, and dividing by the number of solar years 4,320,000, we find that in these 3,244,000 years the moon gained over the sun 40,124,477\frac{13}{8} revolutions. Dropping again the whole revolutions, we see that the moon was in advance of the sun at the moment of our epoch by 112 degrees, or 112 degrees. Therefore these 112 degrees must be added, and all the numbers of this method in this their explanation. The result for our gauge-date, 358° 41′ 46″, is the number of degrees, minutes, and seconds by which the moon is in advance of the sun at the moment of the beginning of the solar year 821, that
is, in the moment when the sun enters Aries. As in the beginning of the luni-solar year sun and moon must have been in conjunction, the beginning of the luni-solar year has preceded that of the solar year by an interval which was just sufficient for the moon to make 358° 41′ 46″ in advance of the sun. Now as the moon gains 360 degrees in a lunar month or 30 lunar days, so she gains 12° in every lunar day. Therefore dividing 358° 41′ 46″ by 12, we get the number of lunar days and fractions by which the luni-solar year’s beginning preceded that of the solar year. The fractions of the lunar days are changed to ghaṭīs and cashakas. Thereby we get 29 days 53 ghaṭīs 29 cashakas as the time by which the beginning of the luni-solar year preceded the sun’s entering Aries, in agreement with the fraction of the adhimāsa month found on p. 31, l. 17. For $\frac{4^{33}}{80}$ adhimāsa months are also equal to 29 days 53 ghaṭīs 29 cashakas. The number 27 days 23 ghaṭīs 29 cashakas which he gives, p. 55, l. 25, is obtained by dividing 328° 41′ 46″, and not 358° 41′ 46″, by 12 (Schram).

P. 55, l. 17.—The Arabic manuscript has 328 instead of 358.

P. 55, l. 33.—The number is 132° 46½°, and not 132° 46′ 34″ (as the Arabic manuscript has). Therefore the portio anni is not 11° 3′ 52″ 50 ″, but 11 days 3 ghaṭīs 53 cashakas 24″; and the portio mensis not 0° 55′ 19″ 24″ 10″, but 0 days 55 ghaṭīs 19 cashakas 27″

The reason of this calculation is the following:—In a year or 12 solar months the moon gains over the sun 132° 46½°. As she gains 12 degrees in every lunar day, the twelfth part of these degrees will represent the sum of lunar days and their fractions which the solar year contains over 360, that is to say, the sum of adhimāsa days and their fractions. One solar month containing 0 adhimāsa days 55 ghaṭīs 19 cashakas 27″, the number of solar months within which one adhimāsa month or 30 lunar days sum up, will be found by dividing 30 days by 0 days 55 ghaṭīs 19 cashakas 27″. This gives 2 years 8 months 16 days 3 ghaṭī 55 cashaka.

P. 56, l. 1.—There must be a great lacuna, for the first
lines of this page are absolutely without meaning. I am inclined to attribute this lacuna to the source whence the author drew this information, i.e. the Arabic translation of Kāraṇāsāra.

P. 59, l. 23.—The calculation should be made in the following manner:—The sum of days of the kaliyuga is multiplied by the star-cycles of a kalpa and divided by the civil days of a kalpa, viz., $1,577,916,450,000$. So we get the revolutions and part of a revolution which the planet has made during the time elapsed since the beginning of the kaliyuga. But in the beginning of the kaliyuga all planets have not been in conjunction; this was only the case in the beginning of the kalpa. Therefore to the fractions of revolutions which the planet made since the beginning of the kaliyuga, we must add its place at this beginning itself, i.e. the fraction of a revolution which every planet had at the beginning of the kaliyuga, the whole revolutions being of no interest. But Brahmagupta adds these numbers before dividing by the civil days of the kalpa, and this is quite natural, both fractions having by this proceeding the same divisor. Therefore what he calls the basis, ought to be the fraction of every planet at the beginning of the kaliyuga multiplied by the civil days of the kalpa; but he has made a great mistake. Instead of multiplying the fractions by the civil days of a kalpa, viz., $1,577,916,450,000$, he has multiplied them by the years of a kalpa, viz., $4,320,000,000$. Therefore all numbers given on p. 60 as the bases are entirely erroneous. To find the fractions for each planet and the bases we have the following calculation:—From the beginning of the kalpa to that of the kaliyuga there have elapsed $1,972,944,000$ years; so to get the places of the planets at the beginning of the kaliyuga we ought to multiply the revolutions of each planet by $1,972,944,000$, and to divide them by the years of a kalpa, $4,320,000,000$. As these two numbers have the common divisor $432,000$, we multiply the revolutions of each planet by $4567$ and divide them by $10,000$. This will give us the place of the planet at the beginning of the kaliyuga. We have thus for the single planets:

For Mars, $2,296,828,522$ revolutions multiplied by $4567$
and divided by 10,000 give \(1,048,961,585\) revolutions; so the place of Mars at the beginning of the kali-yuga is \(\frac{\text{revolutions}}{10,000}\) of a revolution.

For Mercury, \(17,936,998,984\) revolutions multiplied by 4567 and divided by 10,000 give \(8,191,827,435\) revolutions; so the place of Mercury is \(\frac{\text{revolutions}}{10,000}\) of a revolution.

For Jupiter, \(364,226,455\) revolutions multiplied by 4567 and divided by 10,000 give \(166,342,221\) revolutions; so his place is \(\frac{\text{revolutions}}{10,000}\) of a revolution.

For Venus, \(7,022,389,492\) revolutions multiplied by 4567 and divided by 10,000 give \(3,207,125,280\); so her place is \(\frac{\text{revolutions}}{10,000}\) of a revolution.

For Saturn, \(146,567,298\) revolutions multiplied by 4567 and divided by 10,000 give \(66,937,284\) revolutions; and his place is \(\frac{\text{revolutions}}{10,000}\) of a revolution.

For the sun's apsis, \(480\) revolutions multiplied by 4567 and divided by 10,000 give \(219\) revolutions; and its place is \(\frac{\text{revolutions}}{10,000}\) of a revolution.

For the moon's apsis, \(488,105,858\) revolutions multiplied by 4567 and divided by 10,000 give \(222,917,945\) revolutions; and its place is \(\frac{\text{revolutions}}{10,000}\) of a revolution.

For the moon's node, \(232,311,168\) revolutions multiplied by 4567 and divided by 10,000 give \(106,096,510\) revolutions; and its place is \(\frac{\text{revolutions}}{10,000}\) of a revolution.

Multiplying now the place of every planet by 1,577, 916,450,000, we get the following bases for the single planets:

- For Mars, 1,573,813,867,230.
- Mercury, 1,566,555,451,560.
- Jupiter, 1,575,549,575,325.
- Venus, 1,572,235,950,780.
- Saturn, 1,572,551,534,070.
- the sun's apsis, 340,829,953,200.
- the moon's apsis, 550,061,674,470.
- the ascending node, 671,561,241,120 (Schram).

P. 67, l. 14. A.H. 161.—According to p. 15, the year was A.H. 154. Cf. note to l. 169.

P. 71.—With the orbits of the planets cf. Sūrya-Siddhānta, xii. 90, note.

Pp. 74 seq.—As for the Arabic terminology of these pages, it deserves to be noticed that—
means the true distance = Sanskrit man
dakarna.

(2.) That means the true distance of the
shadow's end; and

(3.) Sinus totus, جـب الكـل = Sanskrit trijyot or trijya, means the sinus of three zodiacal signs or 90 degrees, i.e. the radius.

P. 74. ll. 17, 18.—Instead of TC = the Arabic manus-
script has KC = ك, which has been corrected by Dr.
Schram.

P. 75. l. 34.—The lacuna must be something like the
following:—“For KC must be divided by the divisor kept
in memory” (Schram).

P. 78. l. 27.—This and the two following passages are
not clear. Alberuni does not seem to have understood
the subject, for the shadow is neither the greatest nor the
mean, but the true shadow; and the shadow from which
one is to subtract, i.e. 1581, is nothing else than the earth's
diameter, which also is neither the mean nor the greatest,
but always the same (Schram).

P. 79.—Alakhwārizmi is mentioned here and ii. 114 (on
the various colours of eclipses). According to Fihrist,
p. 47, he composed an epitome of the Sindhind (Brahma-
Siddhānta). He is famous as the author of a work on
algebra, edited by Rosen, London, 1831. Cf. also L.
Rodet, L'Algebre d'Alkhwārizmi et les Methodes Indienne et
Grecque (“Journal Asiatique,” 101 (1878), pp. 5 seq.).

P. 82. Two suns, two moons, &c.—This theory, as well
as the expression fish (a name for the polar star?), seem

P. 84.—Cf. with this table of the Nakshatras a paper of
Thibaut, “The Number of the Stars constituting the several
Nakshatras according to Brahmagupta, &c.,” the “Indian
Antiquary,” 1885, p. 43; also Colebrooke, “Essays,” ii.
284, and Śūrya-Siddhānta, p. 321.
P. 89, l. 32.—In the Arabic text, p. مه, 15, read مه instead of مه. The number of years is 1800, not 2800.

P. 90. Kalâmaka.—This term (also kalâmâ) is explained in Śūrya-Siddhānta, note to ix. 5.

The work Ghurrat-alajâdi, only once mentioned, is perhaps identical with the Kūdū-alghurrâ, which Alberuni quotes in his “Chronology” (my translation, p. 15 et passim). Its author was Abû-Muḥammad Alnâ’ib Alâmūlī, who has used the work of Ya’kūb Ibn Târik. Cf. note to i. 169.

P. 90, l. 21.—Emendation of the khaṇḍakâhâdyaka (also on p. 91), i.e. Uttarakhândakâhâdyaka.

On Vijayanandin (l. 26), the author of Karanatilaka, cf. note to i. p. 156.

P. 101.—The enumeration of mountains, here taken from the Mātya-Purāṇa, may be checked by the help of Viṣṇu-Purāṇa, ii. 141, note 2, and ii. 191 seq. The last name is written bakhshīr in the Arabic, which I cannot identify with an Indian name. Perhaps it is a blunder for mahdīshīr, which might represent mahdšaīla. Vide Viṣṇu-Purāṇa, II iv. p. 197.


P. 102.—The story of Soma, the husband of the daughters of Prajāpati (the lunar stations), occurs in its elements already in the Vedic period. Cf. H. Zimmer, Altindisches Leben, pp. 355, 375.

P. 104.—On the Hindu theory of ebb and flow, cf. Viṣṇu-Purāṇa, ii. 203, 204. The two names, of which I have not found the Indian equivalents, are written bahārān and vuhar in the Arabic.

P. 105. The Viṣṇu-Purāṇa says.—The author seems to refer to Viṣṇu-Purāṇa, II iv. p. 204: “The rise and fall of the waters of the different seas is five hundred and ten (not 1500) inches” (or finger-breadths).
P. 106.—The author’s theory of the origin of the Dībajāt has already been mentioned, vol. i. 233.

P. 110.—As to the strictures of the author on the sincerity of Brahmagupta, cf. note to p. 25 (here ii. p. 263). The passages which excited the indignation of Alberuni do not express the view of Brahmagupta, but were simply taken by him from older books—in fact, written purvaśastrāṇusārena. Cf. Kern, translation of Brihat-Samhīḍa, note to chap. iii. v. 4 (p. 445).

P. 114, l. 12. Kinds of eclipses.—Read instead of this, colours of the eclipses. On Alkhwārizmi, cf. note to ii. 79.

What the author here mentions as a view of the Hindus, agrees literally with Sūrya-Siddhānta, vi. 23.

P. 116.—On the Khandakhādyaka, the Sanskrit original of the Arabic Sindhind, cf. note to i. 153, 154.

P. 118.—On the Brihajjātakam of Varāhamihira, cf. note to i. 219.

P. 119.—Rules for finding the dominants or regents of the day, month, and year are given in the Sūrya-Siddhānta, i. 51, 52; xii. 78, 79.

P. 120.—On the srūdhava (?) of Mahādeva, not to be confounded with the book of the same title by Utpala, cf. note to i. 157.

P. 120. Table of the serpents.—The names of this table must be compared with the names in Vishnu-Purāṇa, ii. 74, 285. The words Sukha and Cakrāhasta seem to be mistakes of the Arabic copyist for Vāsuki and Cakrāhasta.

P. 121.—The names of the dominants of the planets are not known to me from a Sanskrit source. Therefore the pronunciation of some of them remains uncertain.

Pp. 121, 122.—The names of the dominants of the Nakṣatras are given by A. Weber, Uber den Vedakalender Namens Jyotisham, p. 94. Cf. also Sūrya-Siddhānta,
viii. 9, pp. 327 seq., and Vishnu-Purāṇa, II. viii., notes on pp. 276, 277.

Instead of Mūra, the deity presiding over Anurādhā, it would perhaps be better to write Māitra, and in the Arabic ṳ (Vishnu-Purāṇa, ii. p. 277).

The latter part of this list in the Arabic text is not free from confusion.

The regent of Uttarakīṣhūdrapadā is placed side by side with Pārvabhādrapadā, whilst the latter station is left without its regent, which is aja ekapād (Śāra-Siddhānta, p. 343). A part of this word seems to be extant in the square for aeviñe, which has šār, kār. Perhaps this is to be read aeviñe ajaikapād, aha aśekida, in which case the Arabic copyist has made two blunders, dropping part of the word ajaikapād and placing it in the wrong square.

P. 123.—On the sixty-years cycle cf. Śāra-Siddhānta, i. 55, and xiv. 17; Varāhamihira, Bṛhat-Samhitā, viii. 20–53.


Pp. 127, 128.—The dominants of the single lustra are given in Bṛhat-Samhitā, chap. viii. 23.

The names of the single years exhibit some differences from the Sanskrit text (Bṛhat-Samhitā, viii. 27–52).

No. 8, aś Ś instead of dhāva, has risen from a wrong division of the words of the text—
śṛḥmukhabhāvadāvau,
i.e. śṛḥmukha-bhāva-āvau.

No. 9, ś instead of svv, is perhaps a mistake of the copyist of the Arabic text.

No. 15, viśa (in Kern’s edition vṛsha), is not a mistake, but a different reading. The word in brackets (Vṛśabha) is to be cancelled.

No. 18, m, nātu, cannot be combined with pārthiva. It corresponds to nātām. Cf. Kern’s various readings to chap. viii. 35.
No. 30. The name of the thirtieth year is durmukha. Perhaps the reading has risen from a wrong division of these words (viii. 38)—

manmatho ‘syag paratašca durmukhaḥ,

so as to represent the elements -ca dur-. No. 34. (sarma), seems to be a mistake for sarvari or sarvari.

No. 40. parvam is the reading of some manuscripts for parabhava. Cf. Kern, various readings to viii. 41.

No. 48. This year is called ananda by Kern, but the reading of Alberuni, vikrama, occurs also in Sanskrit manuscripts. Cf. various readings to viii. 45.

No. 56. The of the text seems to be a blunder of the copyist for dundubhi (viii. 50).

No. 57. amagāra or amagātri, the reading of certain manuscripts instead of udgāri (viii. 50).

No. 58 and 60. The words (instead of raktākha) and kshaya, seem to be examples of a phonetic change between ak and r.

The same list of names is given in Sārya-Siddhānta, i. 55, note.

P. 130.—With this chapter on the four parts of the life of a Brahman cf. Vishnu-Purāṇa, book III. chap. ix.

P. 131.—The complete verse of Bashshār is this—

"The earth is dark, but the fire is bright,
And the fire is worshipped, since there is fire."

This is the saying of a man whose parents had come as prisoners of war from Tukhāristān on the Upper Oxus, but he was born in Baṣra, and lived in Bagdad under the Khalif Almahdit. As he stood under the accusation of being a heretic (Zoroastrian or Manichaean), or, according to another version, because he had composed satirical verses on the Khalif, he was, notwithstanding his great age, sentenced to be beaten, and died in consequence, A.H. 167 = A.D. 784. Cf. Ibn Khallikān, Vita, No. 112.

P. 134. 1. 1.—The south, as the direction foreboding evil, has already once been mentioned in connection with the islands Laṅkā and Vādavāmukha, vide i. 307, 308.

P. 135.—On the vegetables which must not be eaten, cf. Manu, v. 5, and Vāsiṣṭha, xiv. 33. Nālīt seems to be = Sanskrit nālītā.

P. 136.—The contents of this chapter are nearly related to Viṣṇu-Purāṇa, book III. chap. viii.

P. 137.—The story of King Rāma, the Brahmin, and the Candra, taken from the Rāmāyana, vide in Wilkins’ "Hindu Mythology" (Calcutta, 1882), p. 319.

Pp. 137, 138.—The two quotations of Alberuni from the Bhagavadgītā can hardly be compared with any passage in the book in its present form. Cf. note to i. 29.

P. 139.—On the abhramedha or horse-sacrifice, cf. Colebrooke, "Essays," i. 55, 56.

Pp. 140, 141.—This legend, as given on the authority of the Viṣṇu-Dharma, is not known to me from a Sanskrit source.

P. 142.—As the original of this quotation from the Purāṇas is not known to me, the pronunciation of some of the proper nouns remains uncertain.


P. 145.—I do not know the original of this quotation from Varāhamihira’s Sānśhitā.

Pp. 145, 146.—The words here attributed to Śaunaka are probably taken from the Viṣṇu-Dharma. Cf. note to i. 54.
P. 147.—The story of the head of Brehman is part of the legend of Śiva's fight with the Asura Jalandhara. Cf. Kennedy's "Researches," p. 456.

P. 149.—This and the following chapters treat of subjects which are discussed more or less in every Indian law-book, as in those of Manu, Āpastamba, Gautama, and others. Alberuni, however, does not seem to have drawn directly from any of these books, but rather from his own experience, from what his Pandits had told him, and what he himself had observed during his stay in India.

P. 153.—Alḥajjāj was governor of Babylonia during twenty years under the Omayyade Kalif 'Abdulmalik (684–704) and his son Alwalid (704–714).

P. 153. That a Brahmin and a Cauḍāla are equal to him.—Cf. the saying of Vyāsa, the son of Parāśara, here vol. i. p. 44.

P. 155.—On the forbidden degrees of marriage, cf. Manu, iii. 5.

P. 156.—On garbḍāhāna, stmarītonnayanam, &c., cf. the Dharmakāstra of Gautama, viii. 14; also the Grihyasūtras of Aśvalāyana, i. 13, 14.

P. 157. Thus, when Kābul was conquered, &c.—The sentence added in brackets to indicate the meaning of the author's words, as I understand them, ought to run thus: "(which proves that he abhorred the eating of cows' meat and sodomy, but that he did not consider harlotry as anything baneful or unlawful)."

The detail in the history of Kābul here alluded to is not known from other sources, e.g. Baldadhur. During the Omayya Kaliphate of Damascus, both Kābul and Sijistan bravely fought against the Muslims. During certain years they were subdued and had to pay tribute, but Kābul always remained under the sway of its Hindu (Brahmin) kings of the Pāla dynasty. It was incorporated into the Khalif's empire under the Abbaside Ma'mūn; it had to receive a Muslim governor, but retained at his side
the Hindu Shâh. The same double rule existed in Khwârizm.

About A.D. 950–975 the city of Kâbul was already Muslim, whilst the suburb was inhabited by the Hindus (and by Jews). Kâbul was the coronation-city for the Pâla dynasty, as Königsberg in Prussia for the Hohenzollerns. Even when they ceased to reside in Kâbul, they had to be crowned there.

By the Ispahbad, mentioned by Alberuni, I understand the Hindu governor who ruled over the city for the Pâla king. Our author applies a title of the Sasanian empire to the official of a Hindu empire.

In what year the negotiation referred to by Alberuni took place is not known. Perhaps under Ma'mûn, when the city was definitely ceded to the Muslim conquerors.

It seems to have been the public opinion among Muslims that Hindus considered fornication as lawful, as Ibn Khurdâdbih expresses it (Elliot, "History of India," i. 13), whilst, according to Alberuni, they considered it indeed as unlawful, but were lax in punishing it.

P. 157.—The Buyide prince 'Aḍud-aldaula, who held Persia under his sway, died A.H. 372 = A.D. 982. Not long before Alberuni wrote, the last of their dominions had been annexed to the empire of Maḥmûd of Ghazna.

P. 158.—'Iyâs Ibn Mu‘âwiya was judge in Basra under the Omayya Khalif Omar Ibn ‘Abdala‘zîz, and died there, A.H. 122 = A.D. 740.


P. 166.—For the first quotation from *Phædo*, 81D, cf. note to i. p. 65. The second quotation can hardly be identified with any passage in *Phædo*. Perhaps it is derived from a commentary on the following words, 81C:—

ἀλλὰ διειλημμένην γε, οἴμαι, υπὸ τοῦ σωματικοῦ, ὁ αὐτῇ ἡ ὁμολία τε καὶ συνοισία τοῦ σώματος διὰ τὸ ἀεὶ ξυνεῖναι καὶ διὰ τὴν πολλὴν μελέτην ἐνεποίησε εἴματον.

P. 167.—The quotation from *Phædo* is found 115c–116a:—

Θάπτωμεν δὲ σε τινὰ τρόπον; ὅπως ἂν, ἐφ' ἄλλη ἐκφύγα ὑμᾶς, κ.τ.λ.

ἐγγυποσασθε ὁν με πρὸς Κρίτωνα, ἐφ' ἐλεαντίαν ἐγγυγην ἢ ἤν οὕτως πρὸς δικαιασθήνῃ γυγαμῆν, οὕτως μὲν γὰρ ἢ μὴν παραμενεῖν. ύμεῖς δὲ δὴ μὴν μὴ παραμενεῖν ἐγγυποσασθε, ἐπειδὴ ἄποθανο, ἀλλὰ οἰκήσεσθαι ἀπόκλισιν. ἰνα Κρίτωνι μίνον φέρη, καὶ μὴ ὀρθῶν μοι τό σῶμα ἡ καιόμενον ἡ κατορριτόμενον ἀγανακτῇ ὑπὲρ ἐμοῦ ὡς δεινὰ πάσχοντος μὴ δὲ λέγη ἐν τῇ ταφῇ, ὡς ἡ προτίθεται Σωκράτη ἐκφέρει ἡ κατορρίττει, κ.τ.λ.

ἀλλὰ θαρρεῖν τε κρῆ καὶ φάναι τού πῶς σῶμα θάπτειν καὶ θάπτειν οὕτως, ὅπως ἂν σοι φίλον ἢ καὶ μάλιστα ἡ γῆ νόμιμον εἶναι.

P. 168. Galenus, &c.—I do not know the Greek original of this quotation. Cf. note to i. p. 35.

P. 69.—The words of Vāsudeva are a quotation from *Bhagavad-Gītā*, viii. 24.

P. 171. Johannes Grammaticus.—Cf. note to i. 36.

P. 171.—The two quotations from *Phædo* are found in 62c:—

ἰδὼν τοὺν ταύτης οὐκ ἄλογον μὴ πρότερον αὐτῶν ἀποκτηνοῦν δεῖν, πρὸν ἀνάγκην τινὰ θεὸς επιτέμψῃ, ὡς περὶ καὶ τὴν τὴν ἡμῖν παράσχειν.

And 62b:—

ὡς ἐν των φρουρῶν ἐσμεν οἱ ἀνθρωποὶ καὶ οὐ δεὶ δὴ
P. 174.—For the *Vishnu-Purāṇa*, vide note to i. 54. The reading *Duve* is not certain, as the Arabic text has only *59a*. The names *Dilipa*, *Dushyanta*, and *Yayati* have been verified by means of the index to *Vishnu-Purāṇa*.


P. 176, l. 11.—The Arabic manuscript has *ś*, i.e. *dīwaj*. For the word *attājaja*, cf. H. H. Wilson, “Essays and Lectures,” ii. 232.

P. 176, l. 19. *Devashti*.—The latter half of this word is apparently a derivation from the root *svap* = to sleep. In Prakrit *sleep* = *sivino* (Sanskrit *svapna*). *Vide Vararuci*, i. 3.

P. 177, l. 20.—*Deothithā*, also called *deothām* and *dittīhvan*. Cf. H. H. Wilson, “Glossary of Technical Terms,” pp. 133, 134, 143, and “Memoirs on the History, Folklore, and Distribution of the Races of the North-Western Provinces of India,” by H. Elliot, edited by J. Beames, i. 245.

P. 177.—The here-mentioned *bhitsha-paṅca-rātri* seems to be identical with the *bhitsha-paṅcakām* mentioned by Wilson, “Essays and Lectures,” ii. 203.

P. 177.—The name *Gaur-t-r*, *jaś*, occurs also ii. 179, and is apparently a vernacular form for *gaur-tṛityā*. Cf. Wilson, l. l. p. 185.

P. 178.—With this calendar of festivals are to be compared the treatise of H. H. Wilson, “The Religious Festivals of the Hindus,” in his “Essays and Lectures,” ii. p. 151 seq., and Garčin de Tassy, *Notice sur les fêtes popu-

This chapter has been translated into Persian by Abū-Sa'īd Gardezi (manuscript of the Bodleian Library in Oxford, Ouseley 240). Cf. note to ii. 6.

P. 178. Agdūsz. The Arabic has only جدوس, which might be something like ajya-divasa.

Multai. This pronunciation is given by the manuscript. The name, not to be confounded with the Arabic name Mattā (Matthæus), is perhaps identical with the name of a prince of Siwistan mentioned by Elliot, "History of India," i. 145-153.

Hindol-caitra. Cf. Dola-yātra or Holt of Wilson, p. 223.

Bahand. Vide Wilson, l. c., and vasanta, here ii. 179.

P. 179. Gaur-t-r. Cf. note to ii. 177.

P. 180. Gāihat (?), &c. In the Arabic text the word must be added before ما.

In the following line there is a lacuna, which in my translation I have filled up by the help of the Persian translation of Gardēzi which runs thus:—

کاهسد بود (sic) وابن رض هشمت بود که اندر ابن رض زندانیان را ریخان دهد. In another place Gardēzi writes کاهس.


P. 182. Kirt (?). This is perhaps only a misspelling of the Arabic copyist for کندی, Kandī (Gandī Ribāt-alamīr). Cf. note to i. 317, and Elliot, "History of India," ii. 112, 150; iv. 138; Bāhākī, ed. Morley, p. 274. It is the place where King Mas'ūd was murdered.


P. 183.—Cāmdha seems to be = caturdāśī māgha, māndartagu = māndadeśṭaka, pārātaktu = pārdadeśṭaka, and māhātān = māghadeśṭam. Cf. Wilson, "Essays," ii. 183, 184, 181.

P. 183.—The festival dhola seems to be identical with holi, holikā or dol-jātrā. Cf. Wilson, p. 147, 210. Instead of dhola the Persian translation of Gardēžī has hōltī.


P. 184.—Pāyattanu is perhaps = pāpdadeśṭam. Cf. pāpdadeśṭakā.

P. 186.—On the 15th Māgha, as the beginning of kaliyuga, cf. Wilson, "Essays and Lectures," ii. p. 208. Alberuni seems to have taken his information regarding the yugādyā or beginning of a yuga from Vishnupurāṇa, III. chap. xiv. p. 168.

P. 187, l. 5.—The number of lunar days, 1,603,000,910 (sic MS.), must, according to Dr. Schram, be altered to 1,603,000,880.

P. 188. Vishvā.—On the use of this term in astronomy, cf. Śūrya-Siddhānta, iii. 6, note.

P. 188.—On Samaya (?), cf. note to i. 336.

P. 189, l. 17, after the table.—The solar year is 365 days 15' 30" 22" 30'', not 365 days 30' 22" 30' 30''. Accordingly the last line must run thus : "(i.e. 1 day 15' 30" 22" 30'' are equal to $\frac{1}{365}$)" (Schram).

P. 190, l. 7.—The bhāgādāra is not 572, as the manuscript has, but 576, and the fraction $\frac{1}{365}$ (Schram).

P. 190.—Auliatta (?). The name is written اولعلی. A more literal rendering is this : "And that which A. the
son of S. has dictated of the same (subject), is based on the theory of Pulisa." This author seems to have been contemporaneous with Alberuni, as also Samaya (ii. 188).

P. 190. Vardhamihira.—Cf. note to i. 54.
The term shadaśtimukha is explained in Śūrya-Siddhānta, xiv. 6, note.

P. 191.—On the Parvan, cf. chap. lx.


P. 192.—On the book Srūdhava, cf. note to i. 157 and ii. 120. Is the word = sarvdhara?

P. 194.—With the theory of the karana, cf. Śūrya-Siddhānta, ii. 67–69.

P. 195.—For an explanation of the term bhukti, cf. Śūrya-Siddhānta, i. 27, note.

P. 197.—The names of the common karana are found in Śūrya-Siddhānta, ii. 69, note.
The other names are Indian numerals of a vernacular stamp. The corresponding Sindhi forms are barkhu (?), bids, tri, etc. Cf. Trumpp, "Sindhi Grammar," pp. 158, 174. The form panchi (=the 15th) has, as far as I can see, analogy in the vernacular dialects.

P. 199.—Sanikranti means the sun's entrance into a sign of the zodiac. Cf. Śūrya-Siddhānta, xiv. 10, note.

P. 200. Alkindi.—The way in which this scholar has transformed the Hindu theory of the karana is instructive, as showing how Indian subjects were handled by the Arabs before Alberuni, even by the most learned and enlightened among them. The first knowledge of these things was probably communicated to the Arabs by the translation of the Brahma-Siddhānta (Sindhind) and Kannjākhādya (Arkand) of Brahmagupta. On Alkindi, cf.
G. Flügel, Alkindî, genannt der Philosoph der Araber, Leipzig, 1857 (in vol. i. of the Abhandlungen für die Kunde des Morgenlandes).

P. 201.—The names of the vīṣṭis, as taken from the Śrādhava (of Mahâdeva?—cf. note to ii. 120), are not known to me from a Sanskrit source. However, vaḍavad-mukha, ghora, and kālārdvīri seem to be certain. The words ग्र and ज्ञ might be plava and jodla, but ज्ञ? The other series of names of the vīṣṭis, according to Alkindî, which by a mistake have been omitted in the Arabic text, may be transliterated in this way:—

(1.) Shûlpâ (śūlapalt?).
(2.) Jāmâdûd (yâmyodadhî?).
(3.) Ghora.
(4.) Nastarînish.
(5.) Dârunt (dâhrint?).
(6.) Kayâlî.
(7.) Bahayarâmani.
(8.) Bikatâ (vyakta?).

P. 204. On the yogas.—The contents of this chapter are near akin to those of chap. xi. of the Sûrya-Siddhânta. Compare also in the same book ii. 65, 66. The technical term pâta, which literally means fall (for its astronomical meaning, cf. l. c. xi. 5, note), has in Arabic been rendered by the word bâna, i.e. falling (page 58, 11, 24), here ii. 207, 208, 209. In the Arabic text on p. 58, 7, read jâ instead of dhâ, and to the word amâna, l. 16, it must be added that the manuscript has āmâna.

P. 205.—On the Karanâtilaka of Vijayanandin, cf. note to i. 156.

P. 207.—The bhuktyantarâ has been explained, ii. 195.

P. 208.—Sydvabala (?) seems to have been a Hindu from Kashmir who had become a Muslim, and wanted, by means of an Arabic book, to be informed on certain chapters of Hindu astrology. The pronunciation Sydvabala is not certain. The Arabic manuscript has siyâwâl.
P. 208.—On the Brahmin Bhaffila, cf. note to i. 157. The names of the yogas which he mentions are not known to me from other sources. The names gandanta, kala-danda, and vaidhrita are certain, and barh is probably varsha.

P. 209.—On Srīpāla, cf. note to i. 164.

P. 210.—With the names of this table cf. Sūrya-Sid-dhanta, ii. 65, note (also p. 432). The جكر of the Arabic seems to be a mistake for حكم, vishkambha; No. 15, كند, a mistake for كن, ganda.

Instead of ājyashmant (name of the third yoga), the Arabic has راصم (rājakama ?); instead of vyatipāta it has كناد (gutipāta ?).

P. 211.—The contents of this astrological chapter are principally taken from the Laghujiṭṭakam (i.e. the smaller book of nativity) by Varāhamihira, of which the chapters i. ii. have been translated by A. Weber (Indische Studien, 2, 277 seq.), whilst the remainder has been translated by H. Jacobi (De Astrologia Indicae horā appellatae originibus. Accedunt Laghujiṭṭaki capita inedita iii.-xii., Bonn, 1872). Alberuni does not always adhere to the order of the paragraphs which we have in the Sanskrit text, and for certain parts he seems to have drawn from some commentary.

The exact meaning of the term seconds of the stars (the same page, ll. 23, 24), جراح النجم، is not known to me.

Pp. 213–215.—The table of planets is taken from chapters ii. iii. iv. of the Laghujiṭṭakam.

For the reading of the terms naisargika, vimśika, and shaḍḍya (p. 215), I am indebted to Prof. H. Jacobi, Kiel.

The number 25, خ, in the column with the heading The scale of their magnitude, seems to be a mistake for 3, خ.

Pp. 217–219.—This table of the zodiacal signs has been taken from Laghujiṭṭakam, chap. i.

Pp. 221, 222.—This table of the Houses has been taken from Laghujiṭṭakam, chap. i. 15.
P. 234.—The notes on comets and other meteorological subjects, with which the author concludes his book, have been taken from the *Brihat-Samhita* of Varāhamihira.


The *children of the fire* are called *ḥutiṭasūṭh* in Sanskrit, in Arabic اَلْوَاد اشْتَان, which I cannot explain.

Pp. 241–244.—This table of comets is taken from *Brihat-Samhita*, chap. xi. 29–51.

The reading بَلِمَكِس, instead of *padmaketu*, seems to be a mistake of the copyist for بلَمِكِس.

INDEX I.

A—Aditya, i. 215
abja, ii. 118
abhi, i. 179
Abhápátri, i. 200
Abháśatlala, i. 230
Abhi, i. 303
abhibhū, i. 340, 341, 342; ii. 66, 85, 87, 122
Abhiro, i. 300, 301, 302
abhra, i. 178
Ābika (?), i. 299
Ādárya, i. 155
Ācād (?), ii. 143
Ādārśa, i. 302
Ādhaka, i. 162, 163, 164
ādhas, i. 290
ādhimāsa, ii. 20 seq., 23; universal or partial, ii. 23
Adhābhāthana, i. 207; ii. 181
ādhomukha, i. 61
ādhi, i. 178; ii. 23
ādipurāṇa, i. 130
Aditi, ii. 121
Āditahaur, i. 206
Āditya, i. 116, 179, 215, 216, 291
Ādityavāra, i. 215
Ādityapurāṇa, l. 130, 168, 217, 229, 230, 232, 248, 358
Ādityaputra, i. 215
adri, i. 178
āga, i. 178
agniṣṭya, i. 132; ii. 66, 91, 92, 94
Agastyaamata, i. 192
Agádós (?), ii. 178
agnyā, i. 290, 297, 301; ii. 203
agneya, i. 358
agni, i. 131, 178, 242, 342, 357, 358, 394; ii. 121, 125
Agniha (1), i. 394
Agnidhra, i. 394
agnihotra, i. 102
Agnijihva, i. 231
Agnimukha, i. 231
Agniśṭya, i. 302
agnirāśa, i. 159
agniśtru, i. 220
āhan, i. 368; ii. 26
ahaśūkra, i. 41
ahargana, i. 355, 368; ii. 26, 27
ahār, i. 34, 46 seq., 48, 60, 116, 184
āhārā, ii. 179
Ahibuddhūya, i. 342; ii. 66, 122
Ahot, ii. 180
ahorātra, i. 359
āindra, i. 135
Airavata, ii. 245
āiśāna, i. 290, 297; ii. 202
āiśānta, i. 393
Aja, i. 342, 358
Aja ekapād, ii. 122
Ajodaha (Ayoḍhyā), i. 200
Ākara, i. 301
ākāśa, i. 178
akabara, i. 172
akabahubhi, i. 179, 403, 407, 408
ākāśi, i. 178
ālikā, i. 360
ālepṭra, i. 203
Amarāvatt, i. 271
Amarāvatipura, i. 271
amāṛavya, i. 348; ii. 185, 197
āmbara, i. 178, 303
āmbaratata, i. 280
Ambarisha, i. 113
Ambeśāthana, i. 301
āmrīta, i. 54, 275, 282, 344; ii. 107
āmśāka, i. 140, 144
āmrīta, ii. 227
āmrī, i. 217, 230
āmphanta, i. 217
ānala, ii. 128
Ānandaapāla, i. 135; ii. 13
ALBERUNPS INDIA.

Bhagavatī, i. 118, 120; ii. 177, 179, 180
Bhāgavata (?), i. 242
Bhāgavatāra, ii. 143, 144
Bhājika, i. 202
bhākṣubhi, i. 173
Bhalla, i. 303
Bhāmnaraja (?), i. 156
bhānu, i. 179, 215, 217
Bhāmuyāsa (?), (cf. Bhāmnarajas), i. 157
Bhāraksacchra (?), i. 300
bhāra, i. 165
bhara, i. 130
Bharadva, i. 300
Bharadvāja, i. 394, 398
bharan, i. 218; ii. 84, 123
Bharata, i. 242, 294
Bhārata, i. 29, 117, 132, 134; ii. i, 147, 152
Bhāratavarsha, i. 249, 294, 295, 296, 297.
Bhārīgava, i. 132, 215, 372, 398
Bhārīma (?), ii. 120
bharmo (?), ii. 104
Bhārakacchra, i. 301
Bhātal, i. 211
Bhātt, i. 205
Bhātīya, i. 173
Bhattiha, ii. 208
Bhātial, i. 280
bhānma, i. 215
bhāntyia, i. 397
bhāra, ii. 127
bhavaketo, ii. 243
Bhāvin, i. 254
Bhavishya, i. 131
bhavishya-purāṇa, i. 130
Bhālakamala, i. 153, 267
Bhāma, ii. 13
Bhāmapala, ii. 13
Bhāmarati, i. 237
Bhāmaseca, i. 403
Bhāmeha, i. 133
bbhāmabaścaha, i. 177
Bhāpavatoraha, i. 302
Bhāpavardhana, i. 300
Bhaj, i. 300
Bhotesavar, i. 201, 206
bbhramara, ii. 92
Bhṛigu, i. 77, 215, 291
bṛguputra, i. 215
bṛguloka, ii. 233
Bhujaga, i. 342
bhūti, i. 353; ii. 80, 83, 195, 200, 205, 206, 207
bbuktyantara, ii. 195
bbhāmi (?), i. 387
Bṛhemara, i. 203
bṛdpa, i. 179
bṛdri, i. 175
Bṛdriśena, i. 387
bṛdrija, i. 171
bṛduloka, i. 45, 232, 233, 238
bṛdasa, i. 90, 92, 93, 178
Bṛdtrapara, i. 303
Bṛdhvanakośa, i. 294
bṛdvarloka, i. 45, 232, 238
bṛdā (?), i. 215
Bṛhats, i. 201
Bṛhrīj, i. 209
bṛla (?), i. 165, 166
bṛtora, i. 282
bṛtīr, i. 259
bṛya, ii. 107
Bṛyāha, i. 259, 260
Bṛyatika, i. 206, 259, 260
Bṛv (f plava), ii. 202
Bṛdha, i. 299
bodhana, i. 215
Brahmaṇda, ii. 237
brahmaṇḍi (?), ii. 116
Brahmagupta, i. 147, 150, 153, 154, 156, 163, 223, 244, 241, 248, 267, 272, 276, 277, 279, 280, 282, 283, 312, 314, 335, 368, 369, 370, 372, 373, 374, 374, 377, 386; ii. 4, 7, 15, 16, 17, 18, 19, 24, 25, 31, 46, 50, 71, 73, 74, 75, 76, 77, 78, 82, 90, 110, 111, 112, 136, 159, 192
brahmaṇhovatū, i. 331
brahmaṇloka, i. 233
brahma, i. 28, 54, 72, 77, 89, 92, 94, 100, 116, 118, 125, 129; his sons, i. 181, 194, 153, 155, 157, 159, 176, 241, 256, 266, 321, 322
śr., 331, 332, 342, 350, 352, 360, 361, 363, 369, 380, 386; ii. 2;
life of, ii. 28, 63, 99, 115, 116, 118, 120, 145, 147, 199, 237
Brahman, era of, ii. 1
brahmaṇa, i. 100, 102, 104, 121
brahmaṇa (?), ii. 159
brahmaṇḍa, i. 131, 221 śr., 237
brahmaṇḍa-purāṇa, i. 130
Brahmaṇḍi, ii. 119
Brahmapura, i. 303
brahma-purāṇa, i. 130
Brahmaputra, i. 387
brahmaśa, i. 98, 247
Brahmarāpa, i. 256
Brahmasāvānti, i. 387
| brahmasiddhânta, i. 138, 153; table of contents, i. 154, 223, 224, 267, 276, 352; ii. 110, 112 | Candrapura, i. 300 |
| Brahmasaivaîvarta, i. 131 | candráyaṇa, ii. 173 |
| Brahmâ, ii. 95, 96, 98, 100, 109, 110, 111, 139 seq., 149, 151, 153, 179, 180, 181, 183, 185, 191 | cámatika (†), i. 344 |
| Brahmottara, i. 263 | Caraka, i. 159, 162, 332 |
| Brihaspati, i. 132, 393 | Carmanâvîpa, i. 301 |
| Brihaspativâra, i. 213 | Carmakhandâla, i. 300 |
| budha, i. 215 | Carmanâvâtî, i. 257, 259; ii. 134 |
| budhâvatâ, i. 213 | Carmanârâo, i. 302 |
| Buddha, i. 40, 119, 121, 158, 243; ii. 169 | Carshahaya (†), i. 394 |
| Buddhodana, i. 40, 380 | cashakha, i. 334 seq., 337; ii. 52, 56, 189 |
| Budhnya, i. 387 | caturyuga, i. 325, 354, 359, 368 seq., 372 seq., 386, 398; ii. 1, 2, 17, 18, 25, 57 seq., 186, 189 |
| burût (†), i. 204 | catutulapada, i. 197, 198, 200 |
| c = candra, i. 215 | Caulya, i. 299 |
| Câbrahasta (†), ii. 120 | candahst, ii. 197 |
| cadur (†), ii. 127 | caust, ii. 197 |
| castra, i. 212, 217, 218, 235, 269, 294, 405; ii. 8, 10, 39, 43, 123, 173, 176; festivals, ii. 175, 186, 187, 193 | caśṭâbala, ii. 225 |
| castra-caśṭahati (†), ii. 179 | chandasi, i. 136 |
| Câstrika (†?), i. 387 | chitra, i. 178 |
| cañhaka, i. 334 | cikita, i. 355 |
| cañkhâ, i. 114, 117, 118, 341; ii. 101, 107 | Châna, i. 261, 303; ii. 239 |
| cañka-svâmin, i. 117; ii. 103 | Cipitanâsika, i. 302 |
| Câkhabhadra (†), ii. 120 | Cûnivasa, i. 303 |
| Câkha, i. 261 | cîrâ, i. 218, 342; ii. 85, 121, 127 |
| cakhañka, i. 387 | citrâbhânu, ii. 127 |
| cakhañka, i. 387 | Citrakâta, i. 301 |
| calaketo, ii. 241 | Citrângada, ii. 120 |
| Calitu (†?), i. 137 | Citrapala, i. 257 |
| cañmâ, ii. 183, 184 | Citrâkatâ, i. 257 |
| cañmara, i. 140 | Citrâdâla, i. 255 |
| Câmundá, i. 120 | Citrasena, i. 387 |
| camô, i. 407 | C-u-d-sara (†?), ii. 143 |
| cañ (†?), i. 163 | Coila, i. 301; ii. 239 |
| Cañcûkâ, i. 302 | Coûka (†?), i. 301 |
| cañâla, i. 101, 239, 344, 381; ii. 137, 138, 153 | Cyavana, i. 231 |
| Candâla, i. 259 | Dâdhî, i. 178, 235 |
| Candarâsa, i. 260 | dadhimanda, i. 235 |
| candra, i. 178, 215, 216; ii. 21, 101 | dadhisgarâ, i. 156, 225 |
| cânдра, i. 135, 215 | Dahàla, i. 202 |
| Candrabâgâ, i. 259 | dahana, i. 178 |
| Candrabâja (†?), ii. 6 | dâharya (†), i. 344 |
| Candráha, i. 206, 259 | dahin, ii. 197 |
| candráhâra, ii. 27 | Dahmakâla, i. 205 |
| candramâna, i. 353, 354 | Dait-bal, i. 208 |
| Candraprâvâta, ii. 143 | Daitâk, i. 189 |
| Candrapura, i. 300 | daitya, i. 91, 231, 237, 247, 248, 267, 272, 279, 280, 364; ii. 140 |
| candramâna, ii. 178, 235 | daityântara, i. 266 |
| dâkshakula, i. 357 | Dakshaputra, i. 287 |
| dâkshina, i. 290 | Dakshinâtya, i. 300 |
ALBERUN'S INDIA.

Dakshinayana, i. 356, 357
Dama, i. 303
dama (=), i. 344
Damin, i. 254
Damodara, i. 403
damodharma, i. 133
Danaka, i. 203
danava, i. 91, 231, 237, 248, 256, 272, 330, 331
danavguru, i. 215
Danda, i. 303; II. 97
Dandahamfr (=), ii. 176
Dandaka, i. 300
Dandakavana, i. 301
dantin, i. 178
Dantura, i. 301
Darada, i. 261
Duran, i. 200
darbha, ii. 130, 131
Dardura, i. 301
Darva, i. 303
Darud, i. 209
dasagitka, i. 157, 386
dasakakeha, i. 176
dasam, i. 175
dasameya, i. 303
Darva, i. 300
Dasanapura, i. 301
Dasaratha, i. 117, 306, 372
Dasartha, i. 301
Dasarna, i. 257
dasahastara, i. 176
Dasara (=), i. 302
Daserrukha (=), i. 300
dasa, i. 178, 342
daata, i. 166
Datta, i. 394
dootthint, ii. 177
dootntara, i. 312, 314, 315
deva, i. 90, 91, 92, 95, 159, 176, 247, 248, 252, 256, 262, 272, 330, 331; ii. 65, 66, 96, 99, 139, 140, 141, 177, 279, 280, 357
devagriha, ii. 178
devaka, i. 330, 352, 369, 372
devakriti, i. 158
devala, i. 132; ii. 235
devaloka, ii. 233
devalantin, i. 215
devanja, i. 387
devapitita, i. 215
devapurohita, i. 215
devazanti, ii. 176
Devaveshta, i. 387
Devata (=), i. 387
devajja, i. 215
Devika, i. 259
Devamana, i. 394
Dharnajaya, i. 231, 398
dhanishtha, i. 218, 291; ii. 85
dhanishtha, ii. 123, 124
dhann, i. 166, 220
Dhanushman (=), i. 302
Dhanya, i. 254
Dhrar, i. 202, 203
Dhara, i. 191
dhara, i. 178
Dharma, i. 40, 132, 242, 291
Dharmavarna, i. 300
dharmasvarni, i. 387
Dhatri, i. 217, 238, 342; ii. 127
dhi, i. 178
Dhivara, i. 262
dhola, ii. 183
Dhritishka, i. 387
Dhritaketu, i. 387
Dhritarashtra, i. 108, 303
Dhriti, i. 179
Dhritimat, i. 394
Dhrupa, i. 399, 241
Dhruvagriha (=), ii. 180
Dhulekha (=), i. 261
dhurvakaketa (=), ii. 242
dhura (=), ii. 21
dhurushadha, ii. 21
Dhutapaka, i. 259
dhayansgrahsahya, i. 155
dhukht, ii. 182
dikshita, i. 102
Dilipa, i. 174
dimasa, i. 359
Dipaka, i. 262
Diptimat, i. 394
Dirghagriva, i. 302
Dirghakesa, i. 302
Dirghamukha, i. 302
Divari (Dravid), i. 173
Divantarida, i. 173
di, i. 173, 179
Divakamba, i. 210
Divakara, i. 158, 215, 217
Divakudu, i. 210
divasa, i. 359
Divdra (=), i. 301
Divaspati, i. 387
divya, i. 42, 374; ii. 235
divyahoratra, i. 329
Divyatattva, i. 157
divyavarna, i. 359, 363; ii. 2
Divyamau, i. 205
Diksh (=), ii. 140
domba, i. 101, 102
INDEX.

ihu, i. 178
Iśvara, i. 31, 179, 361, 362, 363 ; ii. 127

JADŪRA (†), i. 202
Jāgara, i. 230, 300
Jahhrāvar, i. 250, 300, 302
Jalāi, i. 206, 207, 299, 317
Jaimini, i. 127, 132
Jājāhot, i. 202
Jajjaman, i. 200
Jajjanīr, i. 206
Jalaketu, ii. 243
Jalanda, i. 205
Jalapradānīka, i. 133
Jalākṣaya, i. 178
Jalatantu, i. 204
Jamadagni, i. 394
Jambu, i. 235 ; ii. 129
Jambudvīpa, i. 235, 243, 251, 258
janā (?), i. 163
janałoka, i. 232
Janārdana, i. 254
Janārta (†), i. 231
Jandrā, i. 202
Jangala, i. 299
Jāṅgala, i. 300
Jap, i. 300
Janujaṅgha, i. 387
Jarnmapattana (?), i. 301
Jau (?), i. 392, 397
jātaka, i. 100, 157
jātakarman, ii. 156
Jatāsur, i. 303
Jatādhara, i. 301
Jāṭhara, i. 301
Jatt, i. 401
Jattarāur, i. 202
Jaun (Yamunā), I. 199, 200 seq., 206, 254, 259, 261
Jaur, Hindu king, i. 200, 209
Jay, ii. 127
Jayanta (†), i. 251
Jayantii, ii. 175
Jayapatā, i. 135 ; ii. 13
Jimūr, i. 200
Jimūta, ii. 101
Jīna, i. 119, 243
jīnāloka, i. 238
Jīshu, i. 153
Jīta, i. 394
Jītu, i. 220 (? cottham)
jītumā, i. 220
Jīva, i. 215, 358
Jīvaharant, i. 844
Jīvaśāman, i. 157, 164 ; ii. 181, 182

Jīva, i. 215
Jrīgā, i. 302
Jāga, i. 220
Jūdārī, i. 211
Jvāla (†), ii. 202
Jvālana, i. 140, 141, 143, 145, 146, 178
jyāsūthra, i. 217, 218, 340, 358, 403 ; ii. 173; festivals, ii. 179, 193
jyāsūthā, i. 218 ; ii. 85, 86, 122
Jyotis, i. 394
Jyotisha, i. 300
Jyotishmat, i. 394

KA, ii. 242
Kābandha (†), i. 231 ; ii. 238
Kābul, i. 206, 259, 317 ; ii. 157
Kāca (†), i. 261
Kacoh, i. 208, 260
Kacohāra, i. 303
Kacchilya, i. 300
Kadamba, i. 272
Kadar, ii. 129
Kadrā, i. 252
Kalākṣaya, i. 302
Kalās, i. 248, 302 ; ii. 142, 143
Kalāsā, i. 302
Kaj, i. 260
Kajdrā, i. 202
Kakutatha, il. 178
kā, i. 160, 335, 337, 362
kālabala, ii. 226
kālabhāga (?), ii. 231
Kālājina, i. 301
Kālāka, i. 302
kāmahāka, ii. 90
Kālanemi, i. 251
Kālanjar, i. 202
Kalāpāgrama, i. 262
kālākitri, i. 344 ; ii. 203
kalāśi, i. 160
Kālatoyaka, i. 300
Kālavintta, ii. 129
Kālayavana, ii. 5
kālayuktta, ii. 128
kāli, i. 140, 382, 397 ; ii. 1, 193
Kālādara, i. 262
Kālikα (†), i. 261
kalikāla, ii. 1, 5
Kāliāga, i. 231, 298, 299, 301
Kāliya, i. 231
kālyuga, i. 325, 373 ; description, i. 380, 397, 399 ; ii. 1, 4, 17, 18, 28, 59, 60 ; its beginning, ii. 186
Kalākot, i. 390
ALBRUNI'S INDIA.

Kulärjak, i. 207
Kula, i. 261
Kulika, i. 344, 345
Kulinda, i. 298, 300
kultra, i. 220
Kulīta, i. 303
Kulītaalaka, i. 302
Kulīya, i. 299
Kumārī, i. 257
kumbha, i. 220
kumbhakarna, ii. 3
Kumbhaka, i. 321
Kumuda, i. 255; ii. 243
Kumudavati, i. 257
Kunetā, i. 303
Kusājakāri, i. 301
Kūntī, i. 200
Kūntī (Konkan), i. 203
Kuntala, i. 299, 300
Kupattha (1), i. 263
kūra-babaya (2), i. 158
Kurāha, i. 200
Kuravā, i. 302
kūrma, i. 131
kūrmacakra, i. 297
kūrma-purāna, i. 130
kurob, ii. 66
Kuru, i. 132, 249, 262, 292, 299, 350
Kurukshestra, i. 308, 316; ii. 147
Kurura, i. 254
kusa, i. 235, 297
kusādhipa, i. 235, 254, 325
Kushākūsa, i. 263
Kusapraparāsha, i. 262
Kusinārtī, i. 206
kusaumā, i. 140, 146
kusumakāra, i. 357
Kusumanaga, i. 301
Kusumapura, i. 316, 330, 335, 370
kuṭāra, i. 120
kutthāra, i. 181
Kutū, i. 205
kuttakā, i. 155

La, i. 140
Laddha (1), i. 205
laghu, i. 138
Lagatūrmān, ii. 13
laghu, i. 145, 146
Lahore, i. 259
Lahirī, i. 208
lakṣha, i. 175, 236, 284
lakṣmī, i. 54; ii. 189
lakṣmīkāra, i. 61
Lampāsaka, i. 259, 317; ii. 8
Lampāsaka, i. 300

Lambā, i. 259; ii. 8
Lāttālīśa, i. 257
Laṅkā, i. 209, 267, 268, 301, 303, 306 sqq., 316, 370
Lārāka, i. 209
Lārāja, i. 205
Lārī, i. 173
Lāta, i. 153, 268, 269, 290
Lātadeva, i. 173
Laṅkāvur (Lahore), i. 206, 208
Lauhitā, i. 317
Lauhrā, i. 332
Laukikakāla, ii. 9, 54
lavā, i. 336, 337, 362
lavara, i. 235
lavapumubhi, i. 156
lavānasamudra, i. 235
Likhitā, i. 131
likhyā, i. 162
līka, i. 117, 131, 181; ii. 102, 103
Līttā (1), i. 300
liyaya, i. 229
lōcana, i. 178
Lohitārā, ii. 8
lokākāla, ii. 8
lokānanda, i. 157
Lōṅt, ii. 6
Loharānt, i. 205, 208, 280, 316
Lohitā, i. 259
Lohita, i. 231; ii. 143
Lohitanadī, ii. 143
Lohitya, i. 301
loka, i. 59, 232, 238
lokāloka, i. 236, 237, 249, 284, 286
lokāpāla, i. 247
Lōpa (1), i. 257

Maddersana (1), ii. 142
Mādhava, i. 403
Madura (1), i. 300
Madhu, i. 394
Madhusūdana, i. 403
madhya (1), i. 140, 141, 143, 144, 145, 146, 175
madhyadeva, i. 173, 198, 251, 290
madhyaloka, i. 59
madhyama, ii. 195
madhyamāya, ii. 228
Madra, i. 302
Madrakā, i. 303
madri (1), i. 181
Madura, i. 298
madya (1), i. 252
Magha, i. 31, 121
Magadha, i. 299
Magadha, i. 262, 298, 301
INDEX.

Māgadha, i. 255, 394
māgha, i. 211, 217, 218, 403; ii. 177; festivals, 183, 186
māgā, i. 218, 390, 391; ii. 84, 121, 124, 180
mahābūta, i. 41, 42, 321, 382
Mahācīn, i. 207
Mahādeva, i. 54, 92, 93, 94, 117, 118, 119, 120, 121, 130, 131, 136, 158, 176, 179, 181, 292, 342, 361, 362; ii. 6, 102, 165, 120, 125, 140, 143, 144, 147, 178, 180, 181, 182, 184, 182, 239
Mahāgauri, i. 257
Mahāgri̇va, i. 301
Mahājambha, i. 231
mahājāvala, i. 60
mahākāla, i. 292
mahākalpa, i. 332
mahākāya (?), i. 230
Mahāmegha, i. 231
Mahānāda, i. 257
Mahānāra, i. 259
mahāsūvamoli, ii. 179
mahāśātpada, i. 175, 176, 247; ii. 120
Mahāśāstra, i. 299
mahāsūrya, i. 232, 238, 325
Mahāśāva, i. 302
Mahāśā-sūla, ii. 101
mahāsūla, i. 176
mahātāla, i. 230
mahātāna, ii. 183
Mahātāvīru, i. 301
mahāśāstra, ii. 183
Mahāvīrakā (?), i. 257
Mahāvīrya, i. 386
Mahendra, i. 242, 247, 257, 301
mahēya, i. 216, 300
mahētha, i. 178
Mahīṣa, i. 254, 299, 325
Mahōshāñala, i. 231
Mahātaradas, i. 303
Mahūra, i. 109, 202; ii. 147, 175
Mahvī, i. 206
Mahvīka, ii. 101
maitra, i. 358
Maitreya, i. 63, 388, 397
Maitreyī, ii. 174
Maitrī, i. 202
maku, i. 204, 219, 220; ii. 93
makardā, i. 358
mala, ii. 20
Māla, i. 299
Mālāta (?), i. 300
malamāsa, ii. 20
Mālāva, i. 173, 191, 202, 219, 299
300, 303, 308
Mālavartika, i. 299
Mālaya, i. 200, 247, 257, 301
Mālayaparvata, i. 248
Māinda, i. 301
Mall, i. 300
Mallvā, i. 173
Malvasālān, i. 173
Mālayavant, i. 248
māna, i. 166, 353, 355
Mānabala, i. 303
manas, ii. 44
mānasa, i. 157, 247, 255, 256, 366;
ii. 143, 245
Mānasottama, i. 256
manda, i. 215; ii. 142
Mandage, i. 255
Mandāgir, i. 203
Mandahākūr, i. 206
Mandakini, i. 257; ii. 142
Mandakakar, i. 317
Mandavāhīnt, i. 257
Māndavīya, i. 157, 300, 302, 303
Mandeha, i. 254
māgala, i. 178, 215, 261
māgkalabāra, i. 213
manguniha (?), ii. 245
maniketu, ii. 243
Manimān, i. 302
Manittha, i. 157
manmatha, ii. 127
Manojava, i. 387
mānasartag, ii. 183
Manu, i. 131, 132, 157, 179, 241,
388; his children, 387, 393; ii.
110, 111, 118, 127, 162
manushyḁ̄kābārā, i. 323
manushyabāloka, i. 59
manusvā, i. 179, 241, 291, 359,
361, 367, 369, 372 seq.; their names, 387, 393, 398; ii. 1,
2, 17, 118, 119
Mara, i. 261
Māraka, i. 302
mārga, i. 178
mārgādha, i. 217, 218, 358, 402,
403; ii. 10, 174; festivals, 182,
193
marici, i. 163, 242, 390
Mārīkāla, i. 302
Mārigala, ii. 8
Mārkandeya, i. 54, 131, 241, 321,
340, 360, 372, 386; ii. 2, 3, 64, 66
mārkandeya-purāṇa, i. 130
Mara, i. 261, 300
Marupattana, i. 301
Marukuccha, i. 302
Marut, i. 199
māsa, i. 179, 359
mātrādhama, i. 178
mātha, i. 160, 161, 162, 163, 164; ii. 206
Māhaka (†), i. 299
māsopavāsa, ii. 173
Mathara, i. 302
Mathurā, i. 300, 308, 401, 403; ii. 5
mātrā, i. 139, 140
mātayā, i. 131, 300
Mātāya, i. 262
Mātayā-purāṇa, i. 130, 166, 235, 236, 247, 248, 251, 252, 254, 255, 258, 261, 271, 284, 285, 286, 325; ii. 62, 65, 101, 102, 142, 245
Man, i. 157
manasala, i. 133
māyā, i. 344
Meda, i. 300
Medhādhūti, i. 394
Megha, i. 231
Meghvāṇa, i. 302
Mekala, i. 300, 301
Mera, i. 249 seq., 257, 265, 271, 274, 302, 309, 318; according to the Buddhās 132, 326, 327, 329; i. 82, 96, 129, 142
mesa, i. 220
mehādī, i. 357
Mira, i. 260
mümanāśa, i. 132
mula, i. 220
Mithilā, i. 301
mithuna, i. 219, 220
Mira (Meerut), i. 205
Mitra, i. 217, 242, 342; ii. 122, 199
Mitralākhya, ii. 115
mitecha, i. 19, 302; ii. 187
modaka, i. 136
moksha, i. 70, 80; ii. 138
mokshadharma, i. 133
mor, i. 166
Mrāvarta, i. 249
Mrīga, i. 255
Mrīgalāchāra, i. 137; ii. 102
Mrīgasthāna, ii. 86
Mrīgasrāha, i. 218, 342; ii. 84, 121
Mrīgayādha, ii. 91
Mrītasāminjyvan, i. 254
Mrītāla, i. 230
Mrītasyāra, i. 244
Mrītuyu, i. 385
Mrūna, i. 261
Mucukunda, i. 231
Mudrakara (?), i. 299
Mūhrā (Sindh), i. 204
mubhūta, i. 239, 257, 337, 388 seq.; 341; their names, 342, 356; ii. 118, 119, 243, 244
Mukta, i. 301
Mūla, i. 218, 298; ii. 85, 122, 179
Mūlaśāhāna, i. 298
mūlatrikona, ii. 225
Mūlikā (†), i. 300
Mūlān (mūlaśāhāna), i. 21, 116, 153, 205, 211, 240, 260, 300, 302, 308, 317; ii. 6, 8, 9, 54, 145, 148, 184
Mundla (†), i. 299
Mungiri, i. 200
Munha, i. 208
muni, i. 98, 178, 238
Mūnja, i. 231
Mur, i. 357
Mūshika, i. 299
Mūttah, ii. 173
Nābara (†), i. 357
Nābhāga, i. 394
nādā, i. 335
nāga, i. 178
nāga, i. 91, 178, 247, 267, 344; ii. 120, 197, 198
Nāgadvipa, i. 296
nāgaloka, i. 59
nāgara, i. 173
Nāgarapūra, i. 156
Nāgarasmrīttā, i. 257, 296
Nāgārjuna, i. 189
Nāgarkot, i. 260; ii. 11
Nagha, i. 394
nagna, i. 121
Nagnaparna, i. 301
Nahusha, i. 92
Naijā, i. 201
nairyita, i. 290, 297, 301
nairity, i. 203
nāsargika, i. 215, 227
nāsargikāla, ii. 227
Nāti (†), i. 300
nakh, i. 179
nakshatra, ii. 64
nakshatramana, i. 353, 354
nakshatranātha, i. 216
Nakula, i. 498
Nalaka, i. 200
nalit, ii. 135
Nālikera, i. 301
Nalini, i. 261, 262
nalva, i. 166
ALBERUNI'S INDIA.

Pāṇinīpat, i. 205
pāṇja, i. 235
Pāṇajavār (f.), i. 209
pāṇti, i. 166
pāpejvara, i. 216
Pārā, i. 257, 259
pārāka, ii. 173
pārāmapada, ii. 2
pārāpadma, i. 176
pārāśrubha, l. 174, 175, 333
pārāśrubhakalpa, i. 333
Pārāśara, i. 44, 63, 107, 131, 157, 369, 385, 394, 397; ii. 96, 208, 235
Pārāśraya, i. 302
Pārāśuruṃa, i. 350
parāśramā, i. 103
Pārīcartana, i. 302
parjñavasu, ii. 128
Pārśvāra, i. 158
parśuhāvin, ii. 128
Pārśvaka, l. 77, 113
parśvārā, ii. 125
Pārśyātra, i. 247, 257, 259, 300
Parjanya, i. 217, 394
Pārnāśa, i. 257, 259
pārvatī, i. 42; ii. 127
pārvīna, i. 220
pārvan, i. 132; ii. 115 seq., 119, 191
Parvān, i. 259
pārvata, i. 140, 141, 142, 145, 146, 175; ii. 101, 193
Parvātamara, i. 263
parvatt (f.), ii. 181
pāścima, i. 290
pāścimabhūmi, i. 230
Pāśupāla, i. 303
pāta, i. 207
pātala, i. 59, 230, 397; ii. 140
Pāṭaliputra, i. 200
pāṭalajala, i. 8
Patañjali, i. 27, 55-56, 68-70, 76, 80, 81, 82, 87, 93, 182, 189, 232, 234, 235, 236, 238, 248
Pāthēśvara, i. 229
patti, i. 407
patrīpa, i. 178
Paulisa, i. 153, 266
Pauṇḍra, i. 301
Pauṇḍra, i. 303
pauśa, i. 217, 218, 358, 403; ii. 174, 177; festivals, 185, 193
pāvaka, i. 178
pavana, i. 178
Pārvati, i. 261, 262
pavitra, ii. 130
Payastha, i. 257
Phalagula, i. 302
phālguna, i. 217, 218, 353, 363; ii. 174; festivals, 183, 193
Pānārāha, i. 301
Pēnagiri, i. 303
pīllumu (f.), ii. 129
pīna, ii. 104
Pīnḍārka, ii. 120
Pīṅgala, i. 127; ii. 128
Pīṅgala, i. 303
Pinjaur, i. 205
Pipāla, i. 257
Pūrva, i. 158
Pīṭabika (f.), i. 257
pūrva, i. 69, 90, 92, 247; ii. 236
Pīta, i. 255
pītaḥpūrṇa, i. 230
pītaḥpūrṇa, i. 178, 361
pītaḥpūrṇa (f.), ii. 142
pītanā, i. 89, 93, 222, 248, 330, 357; ii. 121, 122, 123
pīṭaḥ, i. 349
pīṭhikā, i. 223, 236, 238; ii. 233
pīṭhikāhambhāra, i. 328
pīṭhikākāla, i. 180
pīṭrā, i. 358
Pīvāra, i. 394
plakāha, i. 235
plava, ii. 128
plavāṅga, ii. 128
Pojjotisika, i. 299, 301
prabha, i. 337
Prabhāda, i. 365
prajāpati, i. 89, 92, 94, 159, 291, 357, 398; ii. 102, 121, 125, 127, 238
prakṛti, i. 41
pramāṇa, i. 353
pramāda, ii. 128
pramāṣṭhāna, i. 127
pramaṇa, ii. 127
Pramukha (f.), i. 387
prāmaṇa, i. 277, 334 seq., 337, 339, 361, 394
Prāmaṣṭādri, i. 302
prāmaṇa-guhāmāna (f.), i. 153
prastha, i. 162, 163, 164, 165
prasthāna, i. 133
prathama, i. 205
Pratihāra (f.), i. 299
Pratimājjas, i. 394
Prātragiri (f.), i. 299
Prayāga, i. 300; ii. 170, 241
INDEX.

prāyaścitā, i. 355
prayuta, i. 175, 176, 177
pratita, i. 90
Prishaka, i. 262
pritāńa, i. 407
prithivī, i. 233
Prithu, i. 292, 394
Prithūdakasvāmin, l. 158
Prithūvatā, i. 316
Priyavrata, i. 241, 387
Proshthapada, ii. 127
pūhañ (?), ii. 190
pūñavāl (?), ii. 185
Pūlīfīga (?), i. 299
Pulaha, i. 390
Pulastya, i. 360
Pulindra, i. 300
Pulisa, i. 153, 154, 168, 169, 224, 266, 275, 276, 278, 312, 313, 316, 335, 338, 370, 374, 375, 376, 377; ii. 4, 15, 19, 24, 31, 41, 42, 55, 67, 68, 70, 72, 74, 91, 107, 190, 192, 203
Pulisa-siddhānta, i. 153, 177, 275, 333; ii. 31
Pūkala, i. 302
Pūkara, ii. 147
Puleya, i. 300
Pulindra, i. 262
punarvasu, i. 218; ii. 66, 84, 121, 176, 180
Pūcakala (?), i. 157, 366, 367
Pūcjadri, i. 303
punyakāla, i. 187, 191, 192
purāṇas, i. 92; ii. 138
purāṇa, i. 130, 233, 238, 264, 273, 283; ii. 110, 113
Purandara, i. 387, 397
pārāśākaku, ii. 183
Purila, i. 301
Pūrpa, i. 262
pārśmīṇa, i. 348; ii. 185, 197
purabotīa, ii. 132
Purashāvar(Peshavar), i. 206, 259, 317
Purushūr (Peshavar !), i. 338
Puru, i. 387
purusha, i. 31, 40, 321
purusula, i. 32, 338, 338, 350, 351, 360, 386; ii. 118
Purushāda, i. 300
purushāhārātra, i. 392
Purushāparvata, i. 248
Purushāvar (e. Purushāvar), ii. 11
pārva, i. 290
pūrvarahārapadā, i. 218, 240; ii. 85, 122
Pūrvaśēsa, i. 173
pūrvabhāgunt, i. 218, 291; ii. 85, 121, 123
pūrvāhañadā, i. 218, 291; ii. 85, 123
pūrvin, i. 217, 342, 355; ii. 122
pushānīla (?), i. 181
Pushkala, i. 254
Pushkalavatī, i. 302
pushkara, i. 235, 254, 261; ii. 120
pushkaradvipa, i. 235, 255, 256, 284, 286
Pushpajāti, i. 257
pushya, i. 218, 291; ii. 66, 84, 121
pūṭha, i. 171
pūyañanu (?), ii. 184
Rada (?), i. 231
Rahab, i. 261
raiḥ, i. 293; ii. 234
rahu, i. 292
rāhu, i. 292
rāhuññakaraṇa (?), i. 157
rat, ii. 11
raṁbhya (?), i. 387
raṁvata, i. 387
Raṅvata, i. 302
raja, i. 162
rajañhoraṇa, i. 133
Rājagiri, i. 205, 208
Rājanyā, i. 302
rajas, i. 93
rajas, i. 40, 399
Rājārtt, i. 202
Rājāvarī, i. 203
rākṣasa, i. 89, 90, 91, 92, 231, 247, 248, 252; ii. 3, 128
rakta, i. 215
raktabhūmi, i. 230
raktākṣa (?), i. 123
rakkhātim, i. 190
Ramana, i. 117, 121, 166, 209, 228, 396, 307, 310, 372, 380, 397; ii. 3, 137
Ramad (l), i. 257
Rāmañña, i. 307, 310; ii. 3
Rameshvar (l), i. 209
Rāmañña (?), i. 209
Rāmañña, i. 249
randhira, i. 178
Raṣaka, i. 192
rasa, i. 42, 178, 188
raṣṭhala, i. 230
raṣṭhana, i. 80, 198, 191, 193
raṣṭhana-tantra, i. 166
Raṣṭhira, i. 301, 309
raśmi, i. 178
INDEX.

Sāmhitā, i. 157, 167, 298, 299, 320, 329, 391; ii. 66, 86, 88, 92, 107, 110, 111, 115, 123, 125, 145, 192, 256

śāmī, ii. 141

Śāmkara, ii. 147

Śāmkaraśāna, i. 398

Śāṅkhyā, i. 8; quoted, i. 30, 48, 62, 64, 75, 81, 83, 89, 92, 132

śāṅkṛatī, i. 344; ii. 158, 189, 190, 199

śamāra (?), i. 295

śamudra, i. 175, 178

Śamāhuka, i. 262

Śaṅvarta, i. 131; ii. 244

śaṅvatāka, ii. 101

Śaṅvatsara, i. 242; ii. 8, 9, 123, 125, 129

Śaṅhyaparipūra, i. 271

śaṅkāśa, i. 215

śaṅkāśarabha, i. 213

Sanaka, i. 325

Sananda, i. 325

Sanandamāthā, i. 325

sandhāsaka, i. 67

Sandās, i. 209

Śāṇī (?), ii. 142

Śāṅgahila (śrīkhalī ?), i. 158

Śāṅgavanta (?), i. 261

śāṅgaha, i. 40

Śāṅkara, i. 94

śāṅkha, i. 114, 131, 301, 338; ii. 120

Śāṅkhāya, i. 231

śāṇu, i. 166, 175, 176

Śāṅkukarna, i. 231

Śāṅkupatha, i. 262

śānta (?), ii. 188

Śāntahāya, i. 387

Śāntamū, i. 107

śānti, i. 133, 387,

Śāntika, i. 302

śānta, i. 358

śāpta, i. 173

śāpatahāya, i. 339

śāra, i. 173

śāra, i. 113

śarabhā, i. 203

Śārad, i. 257; ii. 93

śāradā, i. 117, 203

Śāradāhu, i. 302

śāśāṭīmukha, i. 190

Śāraṇavata, i. 158, 300, 398

Śāraṇavatī, ii. 99, 142

śārīvalī, i. 158

Śaraya, i. 259; ii. 143

Śaruyatī (?), ii. 143

śārkara, i. 280

śārpa, ii. 129

śārpa, i. 358

Śarpā, ii. 121

śarpā, i. 235

Śaru, i. 257, 261, 405; ii. 105, 142

Śarva, i. 259, 261

śarvadhārin, ii. 127

śarvajit, ii. 127

śarvati (?), ii. 128

Śarvatraga, i. 397

Śaryāti, i. 387

śāśalakāśana, ii. 103

Śāśideva, i. 135

śāśidevavrīti, i. 135

śāsīn, i. 178; ii. 115

śastra, ii. 241

śat, ii. 197

śatābhishaj, i. 218; ii. 85, 122

śatadyumna, i. 387

Śatās, i. 303

Śatakraju, i. 306

śatam, i. 175

Śatānīka, i. 77

Śatarudra, i. 259

Śataśrsha, i. 231

Śatātāpe, i. 131

Śatāvāhana, i. 136

śatān, ii. 197

śattra, i. 344

śatva, i. 40

Śatyā, i. 157, 394, 399

Śatyaka, i. 385

śatyaloka, i. 232, 233, 238

Śaulika, i. 301

Śaumya, i. 89, 215, 296, 344, 358; ii. 128

Śaumaca, i. 77, 113, 126, 350; ii. 145

saūpta, i. 133

śaura, i. 215

śaurāhargana, ii. 27

śauramāna, i. 353, 354

Śauvitra, i. 298, 300, 302

Śāva, i. 259

śāvala, i. 60

Śavana, i. 394

śāvana, i. 328; ii. 21

śāvanāhargana, ii. 27

śāvanamāna, i. 353

Śavahjula, i. 257

Śavara (?), i. 300, 301

śāvareni, i. 337

śavīti, ii. 121

śavīti, i. 216, 217, 398; ii. 121
INDEX

sutāla, i. 230
Sutapana, i. 394
Sutaya, i. 394
śūtra, i. 158
śuvarṇa, i. 160, 161, 162, 163, 164
Śuvarṇabhūmi, i. 303
Śuvarṇadvipa, i. 210 ; ii. 106
śuvarṇavarga, i. 250
śyāda, i. 235
śyāmukha, i. 302
śyapa, i. 231
śyāgadbhūmi, i. 262
śyāgārāha, i. 133
śyāloka, i. 45, 232, 233, 397
śyārocśa, i. 387
śyārociya, i. 387
Śvaśilakṣaṇa, i. 231
Śvāt, ii. 152
śvāt, i. 218, 391 ; ii. 85, 99, 100, 121
Śvayambhū, i. 393
Śvayambhuva, i. 241, 337
Śvetā, i. 248 ; ii. 142
śvetaketu, ii. 242
Śyāmāka, i. 303
Śyāvabala (i), i. 208

TAITILA, ii. 197, 199
Tākeshar, i. 208 ; ii. 8
Takṣhaka, i. 231, 247 ; ii. 120
Takṣaśāla, i. 302
tala, i. 290
tālā, i. 167, 230
Tālaḥala, i. 302
tālaka, i. 188
Tānalakṣa, i. 392
Tāna, i. 40, 257, 399
Tamas, i. 257
tāmaśa, i. 300
tāmāsaśaklika, ii. 234, 238
tāmāsa, i. 220
Tāmāra, i. 259
Tāmāraliptika, i. 299
Tāmāraparna, i. 301
Tāmārvāna, i. 257, 296
Tānā, i. 263, 205, 209, 298
tanduṇā, i. 204
Tāneshar, i. 117, 199, 205, 300, 308, 316, 317 ; ii. 103, 145, 147
Ṭāgana, i. 303
Ṭanaka, i. 301
tantra, i. 155, 156

suṣṭi, i. 357, 394
Suṣṭi, ii. 120
Śuddhodana, i. 380
Śuddharmatman (i), i. 387
Śudhvīra (i), i. 387
śādra, i. 101, 125, 247, 302 ; ii. 6, 95, 98, 136, 150, 152, 155, 157, 163, 170, 191
Śugriva, i. 156
Śukma, i. 300 ; ii. 101
Śoka (i), ii. 120
Śukhā, i. 271
Śukhāpacarya, i. 271
śukka, ii. 127
śuklabhūmi, i. 230
śuklapakṣa, i. 359
Śukra, i. 132, 215, 358, 394 ; ii. 121, 199
śukrambara, i. 213
Śukrītā, i. 263
Śukrīti, i. 394
Śukṛaśetra, i. 387, 394
Śukti, i. 257
Śuktibirā (i), i. 247
Śuktimat, i. 257
Śukūrā, i. 261
śūle, i. 119, 240
Śūladanta, i. 231
Śūlīka, i. 300, 302
Śumālī, i. 231
Śumānantā, i. 255
Śuṣmadhava, i. 127
Śumedhā, i. 394
Śunāma, i. 206
śūnya, i. 178
Suprayogā, i. 257
sura, i. 235
Śurasas, i. 257
surakṣaṇās, i. 231
Śuṣṭi, i. 299, 300, 302
Śurāśtra, i. 300
Śurejyā, ii. 127
śureṇu, i. 251
dsṛi, i. 217
śūra, i. 163
Śūrapārśa, i. 300
Śūrāparśa, i. 300
śūra, i. 179, 215
Śūracyātri, i. 301
śūrapadbra, i. 215
Śūrya-siddhānta, i. 153
Śūrinābhāvyā, i. 387
Śūsānti, i. 387
Śūshmin, i. 254
śātaka, i. 355
sutāla, i. 230
ALBERUNI'S INDIA.

Tarvâ (f.), i. 301
tapana, i. 178
Tâpasa-râma, i. 301
Tapasvin, i. 394
Tâpti, i. 227
Tapodhriti, i. 394
tapoloka, i. 232
Tapomûrti, i. 394
Taporati, i. 394
taptakumbha, i. 60
Târa (f.), i. 303; ii. 64
Târakkaksha, i. 231
tara, i. 64
târa, i. 127
târi, i. 171
târkabaya-purâna, i. 130
Tarojamâlâ, ii. 13, 14
Tarû, i. 201
Tarîpana (f.), i. 300
Tasakara, ii. 238
tattva, i. 44, 179
Tattvadarûha (f.), i. 394
taukahika, i. 220
Tavallehar, i. 208
Tharpura (f.), i. 300
thohar (Sindhi), i. 192
Tisuri, i. 202
tikani- (f.-)yâtra, i. 158
Tîllîta (f.), i. 300
Tilvat, i. 201
Timinglâdana (f.), i. 301
tîryâgiôka, i. 59
Tishya, i. 254, 372, 380
tithi, i. 179; ii. 194, 195, 201-203
Tobâ, i. 257
tola, i. 160, 162
trâhaga-tâta (f.), ii. 192
trâhi, trohi, ii. 197
Trâipura, i. 300
tranjî, i. 182
trâsânya, i. 344
trayam, i. 178
Trayyârûna, i. 398
tretâ, i. 372
tretâyuge, i. 253, 373, 397, 398; ii. 186
Tridhâman, i. 398
Trividva, i. 257, 263
Trigarta, i. 300, 302
triguna (f.), i. 178
trihiâra-saha (f.), ii. 191
trihaspaka (f.), ii. 191
trijagat, i. 178
trikâla, i. 178
trikâta, i. 178
Trîkûta, i. 248
Trilocamâlâ, ii. 13, 14
Triniâra, i. 303
triâsâhaka, ii. 223
Triparâ (f.), i. 257
Triparântika, i. 249
Tripurti, i. 301
Triśâṅgã, i. 257
Triśîra, i. 231
Trivikrama, i. 403
Trîvîra, i. 398
triya, ii. 197
truṭi, i. 335 sqq., 337, 362, 363
Tukhâra, i. 261, 302
tuâ, i. 165, 219, 220
tuâdhi, i. 357
Tumbavana, i. 301
Tumbura, i. 300
Tungabhadra, i. 257
Turañâna, i. 302
Tûrân, i. 203
Tvâshâtri, i. 217, 342, 358; ii. 117, 121, 127

UDAKA, i. 136
Udayagiri, i. 301
Udôhir, i. 300
Udôlua, i. 300
udrâvâga, i. 220
Udupûr, i. 173
udvâtasa, ii. 125
Udyânamârûra, i. 262
udyôga, i. 133
Ugrabhuttî, i. 135
Ujain, i. 189, 202, 259, 298, 301, 304, 308, 311, 313, 316
Ujjaini, ii. 241
Uyânda (f.), i. 137
Uma-devi, i. 54
Ummâlnâra, i. 209
ûsa, ii. 21
unârûtra, i. 364; ii. 21; universal or partial, 23, 25, 34, 37, 186, 187, 192
Uûjara (f.), i. 231
Upâkâna, i. 263
upari, i. 290
Upâvâsa, i. 301
upavâsa, ii. 172
Uraga, i. 262
Urdhabhushan, i. 200
Urdhvakarna, i. 301
Urdhvakura, i. 231
Urvâ, i. 394
Urû, i. 337
uvara, i. 178
uâmasa, i. 77, 131, 398
INDEX.

Vaiśavrata, i. 271, 387
Vājrayanas, i. 398
vajra, i. 119, 236, 241, 321, 360, 386; ii. 2, 3, 35, 203
vajrabrahmāhātya, ii. 132
Vākā, i. 299
vakra, i. 215; ii. 101
Vālikhiyā, i. 395
Vallabha, i. 192, 193, 209; ii. 5, 6
Vallabha, i. 192; ii. 6
Vālmīkī, i. 398; ii. 3
Vāmana, i. 129, 131, 396, 403
vāmana-purāṇa, i. 130
Vāṃśavara, i. 257
Vāṭhēca (?), i. 394
vānē, i. 178, 300
Vānara, i. 303
Vanaugha, i. 302
Vānavāt, i. 301
Vānāvāsika, i. 299
Vāṅga, i. 301
Vāṅgeya, i. 299
Vānapadevā-pa, i. 387
Vaprīvan, i. 398
Vaprunst, i. 394
var (?), ii. 10
vās, i. 555
Varāha, i. 131
varāha-purāṇa, i. 130
Vārāhī, i. 129
Vāraka, i. 394
Vārāhamāṇa, i. 301
varga, i. 297, 298
Vāricara, i. 301
varna, i. 100
varaha, i. 350
vāshakāś, i. 211, 357; ii. 94
Varuna, i. 217, 242, 271, 292, 342, 355, 372; ii. 92, 115, 123
varuṇa-namāntara, ii. 97
Varvāra, i. 261
Vāsā, ii. 241
vāsara, ii. 118
vassanta, i. 357; ii. 179
Vāsāti, i. 392
Vasāvas, ii. 222
Vāsiṣṭha, i. 115, 131, 225, 239, 266, 280, 340, 390, 394, 398; ii. 66, 96
ALBERUNI'S INDIA.
<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>PAGE(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Abdāl Kārīm Ibn 'Abd Alanjā'</td>
<td>i. 264</td>
</tr>
<tr>
<td>'Abdallāh Ibn Almūkaffa'</td>
<td>i. 169</td>
</tr>
<tr>
<td>'Abd-al-alumn'im v. Abū-Sahl</td>
<td>i. 5</td>
</tr>
<tr>
<td>Abū-Aḥmad Ibn Catleghtagīn</td>
<td>i. 317</td>
</tr>
<tr>
<td>Abū-al-fābābās Al-Ruṣūshāhī (v. Al-Ruṣūshāhī)</td>
<td>i. 6</td>
</tr>
<tr>
<td>Abū-al'āswad Al-du'allī</td>
<td>i. 135</td>
</tr>
<tr>
<td>Abū-al-fāṣif Al-Bustīn</td>
<td>i. 34</td>
</tr>
<tr>
<td>Abū-al-ḥasan of Ahvāz</td>
<td>ii. 19</td>
</tr>
<tr>
<td>Abū-Bakr Al-ṣabbīl</td>
<td>i. 87</td>
</tr>
<tr>
<td>Abū-Ma'nāshar</td>
<td>i. 304; 325</td>
</tr>
<tr>
<td>Abū-Sahl 'Abd-al-alumn'im Ibn 'All Ibn Nūḥ Al-tiflīs</td>
<td>i. 5, 7 (also under 'Abd-al-alumn'im)</td>
</tr>
<tr>
<td>Abū-Ya'kūb of Sijistān, his book</td>
<td>Kastāf-almāshīb, i. 64</td>
</tr>
<tr>
<td>Abū-Ya'qūb Al-biṣṭāmī</td>
<td>i. 83</td>
</tr>
<tr>
<td>'Abd-al-ṣulūl, ii. 157</td>
<td></td>
</tr>
<tr>
<td>Afghāna</td>
<td>i. 208</td>
</tr>
<tr>
<td>Afrāṣābāb</td>
<td>i. 304</td>
</tr>
<tr>
<td>Al-ruṣūshāhī v. Abū-al-fābābās</td>
<td>i. 6, 249, 325</td>
</tr>
<tr>
<td>Alexander, story of his birth</td>
<td>i. 96</td>
</tr>
<tr>
<td>Alexander of Aphrodisias</td>
<td>i. 320</td>
</tr>
<tr>
<td>Alexandria</td>
<td>i. 153</td>
</tr>
<tr>
<td>Al-fasārī</td>
<td>i. 165; 303, 314, 315; ii. 15, 16, 17, 18, 23</td>
</tr>
<tr>
<td>Al-bajrājī</td>
<td>ii. 153</td>
</tr>
<tr>
<td>'Alt Ibn Zain of Tabaristan</td>
<td>i. 382</td>
</tr>
<tr>
<td>Aljāhī, i. 204</td>
<td></td>
</tr>
<tr>
<td>Al-jahānī, book of routes</td>
<td>i. 240</td>
</tr>
<tr>
<td>Alkhalīf Ibn 'Ahmad</td>
<td>i. 138, 147</td>
</tr>
<tr>
<td>Al-khwārizmt</td>
<td>ii. 79, 114</td>
</tr>
<tr>
<td>Alkindī</td>
<td>ii. 200, 291</td>
</tr>
<tr>
<td>Alms'mūrā, i. 21</td>
<td></td>
</tr>
<tr>
<td>Almanac from Kashmir</td>
<td>i. 391</td>
</tr>
<tr>
<td>Almānṣūr, Khalīf</td>
<td></td>
</tr>
<tr>
<td>Al-mansūra</td>
<td>i. 21, 173, 193, 205, 260, 316; ii. 6</td>
</tr>
<tr>
<td>Ammonius</td>
<td>i. 85</td>
</tr>
<tr>
<td>Aphrodisias</td>
<td>i. 407</td>
</tr>
<tr>
<td>Apollonius, de causis rerum</td>
<td>i. 40</td>
</tr>
<tr>
<td>Arabian astronomy (lunar stations)</td>
<td>ii. 61, 90</td>
</tr>
<tr>
<td>Arabian metric</td>
<td>i. 138, 142, 144</td>
</tr>
<tr>
<td>Arabian traditions</td>
<td>i. 170, 185</td>
</tr>
<tr>
<td>Arabic Literature, translation of Caraka, i. 159; Kāliya and Dimna, translation from the Indian corrupt</td>
<td>i. 162</td>
</tr>
<tr>
<td>Arabic; i. 302; different forms of matrimony with them, i. 108; their idols, i. 123</td>
<td></td>
</tr>
<tr>
<td>Aratus</td>
<td>ii. 97, 383; scholia on the Phenomenon, i. 97, 384</td>
</tr>
<tr>
<td>Archimedes</td>
<td>ii. 168</td>
</tr>
<tr>
<td>Ardāshīr Ibn Babak</td>
<td>i. 100, 109</td>
</tr>
<tr>
<td>Ardiyān, Eranian</td>
<td>i. 249</td>
</tr>
<tr>
<td>Aristotle, letter to Alexander, i. 124, 225, 226, 232; φυσική ἔρεισις, i. 320</td>
<td></td>
</tr>
<tr>
<td>Arjābhar</td>
<td>ii. 19</td>
</tr>
<tr>
<td>Arkand</td>
<td>i. 312; 316; ii. 7, 48, 49</td>
</tr>
<tr>
<td>Asclepius</td>
<td>i. 222</td>
</tr>
<tr>
<td>Asvīra</td>
<td>i. 207</td>
</tr>
<tr>
<td>Babylonia</td>
<td>ii. 153</td>
</tr>
<tr>
<td>Bagdād</td>
<td>ii. 15, 67</td>
</tr>
<tr>
<td>Balkh</td>
<td>i. 21, 260, 304</td>
</tr>
<tr>
<td>Barhatagī</td>
<td>ii. 10</td>
</tr>
<tr>
<td>Baridīsh, Eranian</td>
<td>i. 260</td>
</tr>
<tr>
<td>Barmecides</td>
<td>i. 159</td>
</tr>
<tr>
<td>Barshāwīr</td>
<td>i. 109</td>
</tr>
<tr>
<td>Barsakh</td>
<td>i. 65</td>
</tr>
<tr>
<td>Barzīyā</td>
<td>i. 159</td>
</tr>
<tr>
<td>Bashāshīr Ibn Burd</td>
<td>ii. 131</td>
</tr>
<tr>
<td>Bhatsā-Shāh</td>
<td>i. 207</td>
</tr>
<tr>
<td>Bhattavāyūś</td>
<td>i. 207</td>
</tr>
<tr>
<td>bist (= viṣaṭi)</td>
<td>ii. 201</td>
</tr>
<tr>
<td>Bolor mountains</td>
<td>i. 117, 207</td>
</tr>
<tr>
<td>Bolor-Shāh</td>
<td>i. 206</td>
</tr>
</tbody>
</table>
INDEX

Buddhists, i, 7, 21, 40, 91, 121, 156; their writing, 173; their cosmographic views, 249, 336; ii, 169
Būmahang, i, 299

CALENDAR of Kashmir, ii, 5, 8
Ceylon, i, 209; pearls, i, 211
cheet, i, 183-185
China, ii, 104
Chinese, ii, 289
Chinese paper, i, 171
Christianity, i, 6, 8
Christians, their use of the words
Father and Son, i, 88
Christian views, i, 69
Christians, i, 94; ii, 188
Christian traditions, ii, 151, 161
cleopatra, i, 307
Commodus, Emperor, i, 128
Constantine, Emperor, ii, 161

DAIRAL, i, 208
Daizan, i, 109
Dānakh, Persian, i, 163
Denar, i, 309
Dībajāt (Maledives, Laccadives), i, 233; ii, 106
Dirhama, i, 160, 163, 164
diz (Persian), i, 304

EMPIRE,
era of the realm of Sind, ii, 48, 49
era of Yassājird, ii, 48, 49
Eranian traditions, i, 249
Erānshahr, i, 54
Eriithbonius, i, 407

FĀRPA, i, 299
farsakh, Persian, i, 167, 311; ii, 67, 68
Fuli, i, 160
Fūsranj, i, 299

GALENEUR, i, 222, 320; de indole animae, i, 123; book of speeches, i, 95; book of deduction, i, 97; commentary to the Apotheosis of Hippocrates, ii, 163; Protradicus, i, 34; commentary on the Aphorisms of Hippocrates, ii, 35, 36; Kurā yâraw, i, 127, 151
Gauge-year, ii, 2, 7, 28, 31, 39, 44, 47, 48, 50, 53
Ghârma, i, 117, 206, 317
Ghaznî, i, 103
ghâr, measure in Khwârizm, i, 166

Ghurrat-uljât, ii, 90
Ghuss (Turks), ii, 168
Gilgit, i, 207
Gîrnagar, Eranian, i, 250
Girahâb, i, 109
Gospel, quoted, i, 4
Greek legends, i, 96
Greek philosophy, i, 7, 24, 33
Greek traditions, i, 105, 112, 143; origin of the alphabet, i, 172; on the astrolabe, i, 215, 219, 220, 222; on the Milky Way, i, 251, 259; on the first meridian, i, 304; on the chariot of war, i, 407

HĀRĀN, ii, 52
Hebrew, i, 36, 37, 38
Herbadh, i, 109
Hindus, their language, i, 17; classical and vernacular, i, 18; shortcomings of manuscript tradition, i, 18; the metrical form of composition, i, 19; their aversion to strangers, i, 20; their systems of matrimony, i, 107; the balance they use, i, 164; relation between authors (writers) and the nation at large, i, 265; their architecture, ii, 141
Hippocrates, his pedigree, i, 379
Homer, i, 42, 98
Huus, ii, 239

IBN ALMUQAMMA', i, 264
Impilà, name of the rhinoceros with the Negroes, i, 204
India, rainfall, i, 211, 212
Isfandiyâd, i, 193
Islam, sectarian views, i, 31, 263, 264
Isphahān (of Kabul), ii, 157
'Īyās Ibn Mu'awiyah, ii, 153

JABBİTTA, a Muslim sect, i, 31
Jalām Ibn Shaibân, i, 116
Jam, i, 304
Jewish tradition on the tetragrammamon, i, 173
Jews, i, 6, 109; ii, 240
Johannes Grammaticus, refutation of Proclus, i, 36, 65, 226, 231; ii, 171
Jân, Arabised form of jojana, i, 167
Jurfân, i, 258, 305; ii, 182
Jâzârân, i, 308

KÂBUL, i, 22; its history, ii, 10, 157
ALBERUNI'S INDIA.

Kabul-Shâhs, ii. 10
Kâf mountain, i. 193, 249
Kâka'âs, i. 304
Kaiâkhan, i. 304
Kaila and Dinna, i. 159
Kandî (q), ii. 182
Kangdix, i. 304
Kanz-al'îhyâ, title cf. a book of the
Manichaeans, quoted, i. 29
kardjât, i. 245, 375; ii. 205
Karmatiana, i. 116, 117
Kâ'âs, i. 193
Kashmir, i. 117
kâtâ-birda, i. 195
Khândhâkhâdya, Arabic, ii. 208
khûn, Kranian, i. 249
Khoten, i. 206
Khayal-alkushâfâni (by Alberuni),
ii. 208
Khurâsân, i. 21
Khârûsân, sea of, i. 258
Khârûsânian measures, i. 168
kirta (papyrus), i. 170
Kitâb-al-manâsîh-nârât (by Ptolemy), ii.
69
Kitâb-tîbb-shuya, ii. 245
Koran, i. 4; Šâfi' interpretation, i.
83, 85; quoted, i. 170, 222;
sectsarian interpretations, i. 263;
quotation, i. 264; ii. 111, 113
Kulsum, i. 270
Kumair islands, i. 210
Kurtâk, Arabic piece of dress, i.
186, 239
Lacca-dives, i. 210, 233
Lang (dove-country), i. 309
Langalâdha, i. 241, 310
lavand (=clove), i. 309
Lesbânîyya, i. 316
lunar stations (of the Hindus), i.
297
Mahrâm (Yamini-aldaula), i. 22,
117; ii. 2, 13, 103
Makrân, i. 208
Malledives, i. 210, 233
Marâ, Arabic, i. 163, 164, 166
Mânt, i. 48, 54, 55; his Book of
Mysteries, i. 54, 264, 381; ii.
105, 169
Manicheans, i. 7, 39, 111, 123, 159
Miftâb-ilm-alâ'îna (by Alberuni),
i. 277
mîkîyâ, Arabic, i. 166
mînâbâl, i. 160, 161, 163, 164
Munâwîya, Khalfâ, i. 124
Muhammad Ibn Alâqâim, the con-
cqueror of Sind, i. 21, 116
Muhammad Ibn lahâq, of Sarakhs,
ii. 15, 16, 18
Muhammad Ibn Zakariyyâ Al-râst,
i. 319
Muhammad (Buddhists), i. 330
MuqFI, Arabic, a tree, i. 203
Mumama', Arabic, kind of wood, i.
211
Multân, i. 121
Mu'tazila, i. 5
Myrtillus (!), i. 407
Nard, a play, i. 182
Nauroz, ii. 2
Nikâh-almâght, i. 109
Nile, sources, i. 270
numbhar, Persian, i. 343
numbhrâ, Persian, i. 214
Nimroz, i. 193
Nisâhpûr, i. 305
nuhshûr, ii. 225, 228, 229
Ordeal, ii. 159, 160
Oxus, i. 200
Papre, i. 171
papyrus, i. 171
Persian, i. 40; vaﬆyâq-yuskda, i.
158, 213, 214; ussâdâr, i. 241
Persian grammar, technical term, i.
19
Persian metric, i. 138
Persian traditions, i. 21, 63, 100,
109, 193, 304
Plato, i. 43, 65, 67; Leges, i. 105,
123; 379, 385; Timæus, i. 35,
223, 231, 322; Phædo, i. 56, 57,
65-67, 71, 76, 85, 86; ii. 166,
167, 171
Pontus Euxinus, i. 258
Porphyry, quoted, i. 43
Proclus, i. 57, 86
Ptolemy, Almagest, i. 226, 269;
geography, 293, 300; ii. 69
Pythagoras, i. 65, 75, 85
Râhm, island, i. 210
rašt, Arabic, i. 163
Rome, i. 306
Romulus and Remus, i. 112
Rustâm, ii. 246
Sa'bûktau(l, (Nâṣir-aldaula), i. 22
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Śakakāla</em>, ii. 46, 47, 49, 50, 51, 54, 55</td>
<td>55</td>
</tr>
<tr>
<td><em>Śalikand</em>, i. 329</td>
<td>329</td>
</tr>
<tr>
<td>Samarqand, paper of, i. 171</td>
<td>171</td>
</tr>
<tr>
<td>Sarakhs, ii. 15</td>
<td>15</td>
</tr>
<tr>
<td>Satīt, ii. 155</td>
<td>155</td>
</tr>
<tr>
<td>Seven <em>Rābiya</em>, i. 394</td>
<td>394</td>
</tr>
<tr>
<td>Shakh (= <em>Sama</em>), ii. 48, 49</td>
<td>48, 49</td>
</tr>
<tr>
<td>Shamsiyah (Syrmia), i. 21</td>
<td>21</td>
</tr>
<tr>
<td>Shapourkān, i. 304, 308</td>
<td>304, 308</td>
</tr>
<tr>
<td>Shāh, i. 298</td>
<td>298</td>
</tr>
<tr>
<td>shañbāt, Arabic, kind of wood, i. 211</td>
<td>211</td>
</tr>
<tr>
<td>Shīlī, i. 207</td>
<td>207</td>
</tr>
<tr>
<td>Shughnān-Shāh, i. 206</td>
<td>206</td>
</tr>
<tr>
<td>Sicily, i. 124</td>
<td>124</td>
</tr>
<tr>
<td>Sidār, Arabic, piece of dress, i. 180</td>
<td>180</td>
</tr>
<tr>
<td>Stij stan, i. 198</td>
<td>198</td>
</tr>
<tr>
<td>Simonides, i. 172</td>
<td>172</td>
</tr>
<tr>
<td>Sindh, Muhammadan conquest, i. 21, 22, 165; Eranian, i. 260; mission from Sindh to Bagdad, ii. 15</td>
<td>21, 22, 165, 260, 15</td>
</tr>
<tr>
<td>Sindhiud, i. 153, 332, 368; ii. 90, 161</td>
<td>153, 332, 368, 90, 161</td>
</tr>
<tr>
<td>Slavonian, ii. 167</td>
<td>167</td>
</tr>
<tr>
<td>Slavonian, sea of the, i. 258</td>
<td>258</td>
</tr>
<tr>
<td>smallpox (a wind blowing from <em>Lahkā</em>), i. 309</td>
<td>309</td>
</tr>
<tr>
<td>Socrates, i. 25, 55, 170; ii. 171</td>
<td>25, 55, 170, 171</td>
</tr>
<tr>
<td>Sogdiana, i. 249</td>
<td>249</td>
</tr>
<tr>
<td><em>spād-nubra</em>, Persian, i. 323</td>
<td>323</td>
</tr>
<tr>
<td>Sōs, i. 98</td>
<td>98</td>
</tr>
<tr>
<td>Su'āla, i. 204, 211, 270; ii. 104</td>
<td>204, 211, 270, 104</td>
</tr>
<tr>
<td>'Sufi, explanation of the word, i. 33</td>
<td>33</td>
</tr>
<tr>
<td>'Sufta, i. 351</td>
<td>351</td>
</tr>
<tr>
<td><em>Şūfām</em>, i. 8, 57, 62, 69, 76, 83, 87, 88</td>
<td>8, 57, 62, 69, 76, 83, 87, 88</td>
</tr>
<tr>
<td><em>sukkha</em>, measure in Khwārizm, i. 166</td>
<td>166</td>
</tr>
<tr>
<td>'Usamār, Persian, i. 241</td>
<td>241</td>
</tr>
<tr>
<td><em>Syria</em>, i. 270</td>
<td>270</td>
</tr>
<tr>
<td><em>Syriac, paideia</em>, i. 33</td>
<td>33</td>
</tr>
<tr>
<td><em>Tarkīb-al'āflāk</em> (v. Ya'qūb), i. 316, 353; ii. 67</td>
<td>316, 353, 67</td>
</tr>
<tr>
<td>Tartarus, i. 67</td>
<td>67</td>
</tr>
<tr>
<td>Tāshkand, i. 298</td>
<td>298</td>
</tr>
<tr>
<td>Tassar, i. 109</td>
<td>109</td>
</tr>
<tr>
<td>Tibet, i. 201, 206</td>
<td>201, 206</td>
</tr>
<tr>
<td>Tibetana, ii. 10</td>
<td>10</td>
</tr>
<tr>
<td>Tīmūrid, i. 260, 302</td>
<td>260, 302</td>
</tr>
<tr>
<td>Tīz, i. 208</td>
<td>208</td>
</tr>
<tr>
<td>Tūrān, i. 203</td>
<td>203</td>
</tr>
<tr>
<td>Turkš, i. 22, 206, 252, 302; ii. 10, 135, 173</td>
<td>22, 206, 252, 302, 10, 135, 173</td>
</tr>
<tr>
<td><em>Tūz</em>, Persian, name of a tree, i. 171</td>
<td>171</td>
</tr>
<tr>
<td><em>Uṣano</em>, i. 207</td>
<td>207</td>
</tr>
<tr>
<td>Uzain (ajain), i. 308</td>
<td>308</td>
</tr>
<tr>
<td><em>Vakhān-Shāh</em>, i. 206</td>
<td>206</td>
</tr>
<tr>
<td>vellu, i. 171</td>
<td>171</td>
</tr>
<tr>
<td><em>Wakwāk</em>, island, i. 210</td>
<td>210</td>
</tr>
<tr>
<td>Ya'qūb Ibn Tārik, his <em>Tarkīb-al'āflāk</em>, i. 169, 303, 312, 316, 353; ii. 15, 18, 23, 25, 31, 34, 44, 45, 67, 68</td>
<td>169, 303, 312, 316, 353, 15, 18, 23, 25, 31, 34, 44, 45, 67, 68</td>
</tr>
<tr>
<td>Yazdājird, his era, ii. 48</td>
<td>48</td>
</tr>
<tr>
<td>Yemen (distinguished from Arabia), i. 270</td>
<td>270</td>
</tr>
<tr>
<td><em>Zībaj</em>, i. 210; ii. 106</td>
<td>210, 106</td>
</tr>
<tr>
<td>Zanj, the nations of Eastern Africa, i. 252, 270; ii. 104</td>
<td>252, 270, 104</td>
</tr>
<tr>
<td>Zarkān, i. 7</td>
<td>7</td>
</tr>
<tr>
<td>Zindik, i. 264</td>
<td>264</td>
</tr>
<tr>
<td>Zoroaster, i. 21, 91, 96</td>
<td>21, 91, 96</td>
</tr>
<tr>
<td>Zoroastrians (in Sogdiana), i. 249, 260; their dakha, ii. 167</td>
<td>249, 260, 167</td>
</tr>
</tbody>
</table>