

approved general introduction to the study of the Mimāṃsā is the metrical *Jaimintya-Nyāya-māla-vistara*,¹ with a prose commentary, both by Mādhyā Achārya. This distinguished writer, who has already been mentioned several times, was formerly supposed, from frequent statements in MSS., to have been the brother of Sāyana, the well-known interpreter of the Vedas. The late Dr Burnell² has, however, made it very probable that these two are one and the same person, Sāyana being his Telugu, and Mādhyāchārya his Brāhmanical name. In 1331 he became the *jaḡadguru*, or spiritual head, of the Smārta (a Vedāntist sect founded by Sankarāchārya) at the Math of Śringeri, where, under the patronage of Bukka, king of Vidyanagara, he composed his numerous works. He sometimes passes under a third name, Vidyanāya-svāmin, adopted by him on becoming a *sannyāsin*, or religious mendicant.

(2) The Vedānta philosophy, in the comparatively primitive form in which it presents itself in most of the Upanishads, constitutes the earliest phase of systematic metaphysical speculation. In its essential features it remains to this day the prevalent belief of Indian thinkers, and enters largely into the religious life and convictions of the people. It is an idealistic monism, which derives the universe from an ultimate conscious spiritual principle, the one and only existent from eternity—the *Ātman*, the Self, or the *Puruṣa*, the Person, the *Brahman*. It is this primordial essence or Self that pervades all things, and gives life and light to them, "without being sullied by the visible outward impurities or the miseries of the world, being itself apart,"—and into which all things will, through knowledge, ultimately resolve themselves. "The wise who perceive him as being within their own Self, to them belongs eternal peace, not to others."³ But, while the commentators never hesitate to interpret the Upanishads as being in perfect agreement with the Vedāntic system, as elaborated in later times, there is often considerable difficulty in accepting their explanations. In these treatises only the leading features of the pantheistic theory find utterance, generally in vague and mystic though often in singularly powerful and poetical language, from which it is not always possible to extract the author's real idea on fundamental points, such as the relation between the Supreme Spirit and the phenomenal world,—whether the latter was actually evolved from the former by a power inherent in him, or whether the process is altogether a fiction, an illusion of the individual self. Thus the *Kaṭha-upanishad*⁴ offers the following summary:—"Beyond the senses [there are the objects; beyond the objects] there is the mind (manas); beyond the mind there is the intellect (buddhi); beyond the intellect there is the Great Self. Beyond the Great One there is the Highest Undeveloped (aryaktam); beyond the Undeveloped there is the Person (puruṣa), the all-pervading, characterless (alinga). Whatsoever knows him is liberated, and attains immortality." Here the Vedāntist commentator assures us that the Great Undeveloped, which the Sāṅkhyas would claim as their own primary material principle (pradhāna, prakṛiti), is in reality *Māyā*, illusion (otherwise called *avidyā*, ignorance, or *śakti*, power), the fictitious energy which in conjunction with the Highest Self (Ātman, Puruṣa) produces or constitutes the *Īvara*, the Lord, or Cosmic Soul, the first emanation of the Ātman, and himself the (fictitious) cause of all that seems to exist. It must remain doubtful, however, whether the author of the Upanishad really meant this, or whether he regarded the Great Undeveloped as an actual material principle or substratum evolved from out of the Puruṣa, though not, as the Sāṅkhyas hold, coexisting with him from eternity. Besides passages such as these which seem to indicate realistic or materialistic tendencies of thought, which may well have developed into the dualistic Sāṅkhya and kindred systems, there are others which indicate the existence even of nihilist theories, such as the Bauddhas—the *sānyā-vādins*, or affirmers of a void or primordial nothingness—profess. Thus we read in the *Chhāndogya-upanishad*⁵:—"The existent alone, my son, was here in the beginning, one only, without a second. Others say, there was the non-existent alone here in the beginning, one only, without a second,—and from the non-existent the existent was born. But how could this be, my son? How could the existent be born from the non-existent? No, my son, only the existent was here in the beginning, one only, without a second."

The foundation of the Vedānta system, as "the completion of the Veda," is naturally ascribed to Vyāsa, the mythic arranger of the Vedas, who is said to be identical with Bādarāyana, the reputed author of the *Brahma-* (or *Sārtraka-*) *sūtra*, the authoritative, though highly obscure, summary of the system. The most distinguished interpreter of these aphorisms is the famous Malabar theologian Sankara Achārya (7th or 8th century), who also commented on the principal Upanishads and the *Bhagavadgītā*, and is said to have spent the greater part of his life in wandering all over India, as far as Kashmir, and engaging in disputations

¹ Edited by Th. Goldstücker, completed by E. B. Cowell.
² *Vamsa-brāhmaṇa*, Intro. p. 2. 1.
³ *L. S.*, 10; 11. 6, 7.

with teachers—whether of the Saiva, or Vaishnava, or less orthodox persuasions—with the view of rooting out heresy and re-establishing the doctrine of the Upanishads. His controversial triumphs (doubtless largely mythical) are related in a number of treatises current in South India, the two most important of which are the *Sankara-dig-vijaya* ("Sankara's world-conquest"), ascribed to his own disciple Anandagiri, and the *Sankara-vijaya*, by Mādhyāchārya. In Sankara's philosophy⁶ the theory that the material world has no real existence, but is a mere illusion of the individual soul wrapt in ignorance,—that, therefore, it has only a practical or conventional (*vyāvahārika*) but not a transcendental or true (*pāramārthika*) reality,—is strictly enforced. To the question why the Supreme Self (or rather his fictitious development, the Highest Lord, or cosmic soul) should have sent forth this phantasmagory this great thinker (with the author of the *Sūtras*) can return no better answer than that it must have been done for sport (*līlā*), without any special motive—since to ascribe such a motive to the Supreme Lord would be limiting his self-sufficiency,—and that the process of creation has been going on from all eternity. Sankara's *Sārtraka-mīmāṃsā-bhāṣya* has given rise to a large number of exegetic treatises, of which Vāchaspati-miśra's⁷ exposition, entitled *Bhāmatī*,⁸ is the most esteemed. Of numerous other commentaries on the *Brahma-sūtras*, the *Sri-bhāṣya*, by Rāmānuja, the founder Rāmānuja of the Sri-Vaishnava sect, is the most noteworthy. This religious teacher, who probably flourished during the first half of the 12th century, caused a schism in the Vedānta school. Instead of adhering to Sankara's orthodox *advaita*, or non-duality doctrine, he put forth the theory of *viśiṣṭādvaita*, i. e., non-duality of the (two) distinct (principles), or, as it is more commonly explained, non-duality of that which is qualified (by attributes). According to this theory the Brahman (which is identical with Vishnu) is neither devoid of form and quality, nor is it all things; but it is endowed with all good qualities, and matter is distinct from it; bodies consist of souls (*chēt*) and matter (*achēt*); and God is the soul. With this theory is combined the ordinary Vaishnava doctrine of periodical descents (*avatāra*) of the deity, in various forms, for the benefit of creatures. In Rāmānuja's system considerable play is also allowed to the doctrine of faith (*bhakti*). This phase of Indian religious belief, which has attached itself to the Vedānta theory more closely than to any other, and the origin of which some scholars are inclined to attribute to Christian influence, seems first to make its appearance very prominently in the *Bhagavadgītā*, the episode of the *Mahābhārata*, already referred to, and is even more fully developed in some of the Purānas, especially the *Bhāgavata*. In the *Sāṅdilya-* (*Bhakti-*) *sūtra*,⁹ the author and date of which are unknown, the doctrine is systematically propounded in one hundred aphorisms. According to this doctrine mundane existence is due to want of faith, not to ignorance; and the final liberation of the individual soul can only be effected by faith. Knowledge only contributes to this end by removing the mind's foulness, unbelief. Its highest phase of development this doctrine probably reached in the religious creed of the *Bhaktas*, a Vaishnava sect founded, towards the end of the 15th century, by Chaitanya, whose followers subsequently grafted the Vedānta speculations on his doctrine. A popular summary of the Vedānta doctrine is the *Vedānta-sūtra* by Sadānanda, which has been frequently printed and translated.¹⁰

(3) The *Sāṅkhya*,¹¹ or "enumerative" system, probably derives *Sāṅkhya* its name from its systematic enumeration of the twenty-five principles (*tattva*) it recognizes,—consisting of twenty-four material and an independent immaterial principle. In opposition to the Vedānta school, which maintains the eternal coexistence of a spiritual principle of reality and an unspiritual principle of unreality, the Sāṅkhya assumes the eternal coexistence of a material first cause, which it calls either *māla-Prakṛiti* (fem.), "chief Originant" (Nature), or *Pradhāna*, "the principal" cause, and a plurality of spiritual elements or Selves, *Puruṣa*. The system recognizes no intelligent creator (such as the *Īvara*, or demiurgus, of the Vedānta)—whence it is called *nirīvara*, godless; but it conceives the Material First Cause, itself unintelligent, to have become developed, by a gradual process of evolution, into all the actual forms of the phenomenal universe, excepting the souls. Its first emanation is *buddhi*, intelligence; whence springs *ahaṅkāra*, consciousness; thence five elementary particles (*tanmātra*) and eleven organs of sense; and finally, from the elementary particles, five elements. The souls have from all eternity been connected with Nature,—having in the first place become invested with a subtle frame (*liṅga-*, or *śūkṣma-*, *śarīra*), consisting of seventeen principles, viz., intelligence, consciousness, elementary particles, and organs of sense and action, including

⁶ P. Deussen, *Das System des Vedānta*, 1883. A. E. Gough, *The Philosophy of the Upanishads*, also follows chiefly Sankara's interpretation.
⁷ *Brahmasūtra*, III. 1, 32-34.
⁸ Prof. Cowell assigns him to about the 10th century.
⁹ *Bibl. Ind.*
¹⁰ Text, with Svapneśvara's commentary, edited by J. E. Ballantyne; transl. by E. B. Cowell.
¹¹ Last by G. A. Jacob.
¹² E. Röer, *Lecture on the Sāṅkhya Philosophy*, Calcutta 1854; B. St Hilaire, *Mémoire sur le Sāṅkhya*, 1852.

mind. Invested with this subtle frame, they, for the sake of fruition, connect themselves ever anew with Nature, thus, as it were, creating for themselves ever new forms of material existence; and it is only on his attaining perfect knowledge, whereby the ever-changing modes of intelligence cease to be reflected on him, that the Puruṣa is liberated from the miseries of *Samsāra*.

The reputed founder of this school is the sage Kapila, to whom tradition ascribes the composition of the fundamental text-book, the (*Sāṅkhya-sūtra*, or) *Sāṅkhya-pravachana*,¹ as well as the *Tattva-samāsa*, a mere catalogue of the principles. That the *Sūtras* have undergone subsequent modifications might be inferred from the fact that they twice refer to the opinion of Pañchasiṅha, who elsewhere is stated to have received his instruction from Āsuri, the disciple of Kapila, as well as from the sage himself. Of the commentaries on the *Sūtras*, that by Vijnāna Bhikṣu,² a writer probably of the 16th century, is the most approved. An independent treatise by the same author, the *Sāṅkhya-sāra*,³ consisting of a prose and a verse part, is probably the most valuable compendium of Sāṅkhya doctrines. Another admirable and highly-esteemed treatise is *Īvara-kṛishna's Sāṅkhya-kārikā*,⁴ which gives, in the narrow compass of seventy-five śloka, a lucid and complete sketch of the system. Though nothing certain is known regarding its author,⁵ this work must be of tolerable antiquity, considering that it was commented upon by Gaudapāda,⁶ the preceptor of Govinda, who, on his part, is said to have been the teacher of Sankarāchārya.

Yoga.

(4) The Yoga system is merely a schismatic branch of the preceding school, holding the same opinions on most points treated in common in their *Sūtras*, with the exception of one important point, the existence of God. To the twenty-five principles (*tattva*) of the Nirīvara Sāṅkhya, the last of which was the *Puruṣa*, the Yoga adds, as the twenty-sixth, the *Nirguṇa Puruṣa*, or Self devoid of qualities, the Supreme God of the system. Hence the Yoga is called the *Sesvara* (theistical) *Sāṅkhya*. But over and above the purely speculative part of its doctrine, which it shares with the sister school, the theistic Sāṅkhya has developed a complete system of mortification of the senses—by means of prolonged apathy and abstraction, protracted rigidity of posture, and similar practices,—many of which are already alluded to in the Upanishads,—with the view of attaining to an ecstatic vision of, and reunion (*yoga*) with, the Supreme Spirit. It is from this portion of the system that the school derives the name by which it is more generally known. The authoritative *Sūtras* of the Yoga, bearing the same title as those of the sister school, viz., *Sāṅkhya-pravachana*, but more commonly called *Yoga-sāstra*, are ascribed to Patañjali, who is perhaps identical with the author of the "great commentary" on Pāṇini. The oldest commentary on the *Sūtras*, the *Pāṇinīya-bhāṣya*, is attributed to no other than Vyāsa, the mythic arranger of the Veda and founder of the Vedānta. Both works have again been commented upon by Vāchaspati-miśra, Vijnāna-bhikṣu, and other writers.

Nyāya and Vaiśeṣika.

(5) (6) The *Nyāya*⁷ and *Vaiśeṣika* are but separate branches of one and the same school, which supplement each other and the doctrines of which have virtually become amalgamated into a single system of philosophy. The special part taken by each of the two branches in the elaboration of the system may be briefly stated in Dr Röer's words:—"To the Nyāya belong the logical doctrines of the forms of syllogisms, terms, and propositions; to the Vaiśeṣikas the systematic explanation of the categories (the simplest metaphysical ideas) of the metaphysical, physical, and psychical notions,—which notions are hardly touched upon in the Nyāya-sūtras. They differ in their statement of the several modes of proof,—the Nyāya asserting four modes of proof (from perception, inference, analogy, and verbal communication), the Vaiśeṣikas admitting only the two first ones." The term Nyāya (*nī-āya*, "in-going," entering), though properly meaning "analytical investigation," as applied to philosophical inquiry generally, has come to be taken more commonly in the narrower sense of "logic," because this school has entered more thoroughly than any other into the laws and processes of thought, and has worked out a formal system of reasoning which forms the Hindu standard of logic.

The followers of these schools generally recognize seven categories (*padārtha*):—substance (*dravya*), quality (*guṇa*), action (*karma*), generality (*sāmānya*), particularity (*viśeṣa*), intimate relation (*samavāya*), and non-existence or negation (*abhāva*). Substances, forming the substrata of qualities and actions, are of two kinds:—eternal (without a cause), viz., space, time, ether, soul, and the atoms of mind, earth, water, fire, and air; and non-eternal, com-

prising all compounds, or the things we perceive, and which must have a cause of their existence. Causality is of three kinds:—that of intimate relation (material cause); that of non-intimate relation (between parts of a compound); and instrumental causality (effecting the union of component parts). Material things are thus composed of atoms (*anu*), i. e., ultimate simple substances, or units of space, eternal, unchangeable, and without dimension, characterized only by "particularity (*viśeṣa*)." It is from this predication of ultimate "particulars" that the Vaiśeṣikas, the originators of the atomistic doctrine, derive their name. The Nyāya draws a clear line between matter and spirit, and has worked out a careful and ingenious system of psychology. It distinguishes between individual or living souls (*jīvātman*), which are numerous, infinite, and eternal, and the Supreme Soul (*Paramātman*), which is one only, the seat of eternal knowledge, and the maker and ruler (*Īvara*) of all things. It is by his will and agency that the unconscious living souls (soul-atoms, in fact) enter into union with the (material) atoms of mind, &c., and thus partake of the pleasures and sufferings of mundane existence. On the Hindu syllogism compare Prof. Cowell's notes to Colebrooke's *Essays*, i. p. 314.

The original collection of *Nyāya-sūtras* is ascribed to Gotama, and that of the *Vaiśeṣika-sūtras* to Kanāda. The etymological meaning of the latter name seems to be "little-eater, particle-eater," whence in works of hostile critics the synonymous terms *Kana-bhuj* or *Kana-bhaktsha* are sometimes derisively applied to him, doubtless in allusion to his theory of atoms. He is also occasionally referred to under the name of Kāśyapa. Both *sūtra*-works have been interpreted and supplemented by a number of writers, the commentary of Viśvanātha on the Nyāya and that of Sankara-miśra on the Vaiśeṣika *Sūtras* being most generally used. There are, moreover, a vast number of separate works on the doctrines of these schools, especially on logic. Of favourite elementary treatises on the subject may be mentioned Keśava-miśra's *Tarka-bhāṣā*, the *Tarka-saṅgraha*,⁸ and the *Bhāṣā-parichheda*.⁹ A large and important book on logic is Gangeśa's *Chīntāmaṇi*, which formed the text-book of the celebrated Nuddea school of Bengal, founded by Raghunātha-śromani about the beginning of the 16th century. An interesting little treatise is the *Kusumdhājalī*,¹⁰ in which the author, Udayana Achārya (about the 12th century, according to Prof. Cowell) attempts, in 72 couplets, to prove the existence of a Supreme Being on the principles of the Nyāya system.

As regards the different heretical systems of Hindu philosophy, there is no occasion, in a sketch of Sanskrit literature, to enter into the tenets of the two great anti-Brāhmanical sects, the Jainas and Buddhists. While the original works of the former are written entirely in a popular (the Ardhā-māgadhī) dialect, the northern Buddhists, it is true, have produced a considerable body of literature,¹¹ composed in a kind of hybrid Sanskrit, but only a few of their sacred books have as yet been published;¹² and it is, moreover, admitted on all hands that for the pure and authentic Buddha doctrines we have rather to look to the Pāli scriptures of the southern branch. Nor can we do more here than briefly allude to the theories of a few of the less prominent heterodox systems, however interesting they may be for a history of human thought.

The *Chārvākas*, an ancient sect of undisguised materialism, who deny the existence of the soul, and consider the human person (*puruṣa*) to be an organic body endowed with sensibility and with thought, resulting from a modification of the component material elements, ascribe their origin to Brihaspati; but their authoritative text-book, the *Bārhaspatya-sūtra*, is only known so far from a few quotations.

The *Pāñcharātras*, or *Bhāgavatas*, are an early Vaishnava sect, in which the doctrine of faith, already alluded to, is strongly developed. Hence their tenets are defended by Rāmānuja, though they are partly condemned as heretical in the *Brahma-sūtras*. Their recognized text-book is the *Nārada-Pāñcharātra*.¹³ According to their theory the Supreme Being (Bhagavat, Vāsudeva, Vishnu) became four separate persons by successive production. While the Supreme Being himself is indued with the six qualities of knowledge, power, strength, absolute sway, vigour, and energy, the three divine persons successively emanating from him and from one another represent the living soul, mind, and consciousness respectively.

The *Pāśupatas*, one of several Saiva (Māheśvara) sects, hold the Supreme Being (*Īvara*), whom they identify with Siva, to be the creator and ruler of the world, but not its material cause. With the Sāṅkhyas they admit the notion of a plastic material cause, the *Pradhāna*; while they follow Patañjali in maintaining the existence of a Supreme God.

¹ Edited and translated by J. E. Ballantyne.
² Edited and translated, with commentary, by E. Röer.
³ Edited and translated, with commentary, by E. B. Cowell.
⁴ See B. H. Hodgson, *The Languages, Literature, and Religion of Nepal and Tibet*.
⁵ *Lalitā-vistara*, edited and partly translated by Rājendralāla Mitra; *Mahāvastu*, edited E. Senart; *Vajra-parichheda*, edited M. Müller; *Saddharma-pundarika*, translated by E. Burnouf ("Lotus de la bonne loi"); and H. Kern, *Sacred Books of the East*.
⁶ Edited by K. M. Banerjee.

III. GRAMMAR (*Vyākaraṇa*).—We found this subject enumerated as one of the six "limbs of the Veda," or auxiliary sciences, the study of which was deemed necessary for a correct interpretation of the sacred Mantras, and the proper performance of Vedic rites. Linguistic inquiry, phonetic as well as grammatical, was indeed early resorted to both for the purpose of elucidating the meaning of the Veda, and with the view of settling its textual form. The particular work which came ultimately to be looked upon as the "vedāṅga" representative of grammatical science, and has ever since remained the standard authority for Sanskrit grammar in India, is Pāṇini's *Aṣṭādhyāyī*,¹ so called from its "consisting of eight lectures (*adhyaīya*)," of four *pādas* each. For a comprehensive grasp of linguistic facts, and a penetrating insight into the structure of the vernacular language, this work stands probably unrivalled in the literature of any nation,—though few other languages, it is true, afford such facilities as the Sanskrit for a scientific analysis. Pāṇini's system of arrangement differs entirely from that usually adopted in our grammars, viz., according to the so-called parts of speech. As the work is composed in aphorisms intended to be learnt by heart, economy of memory-matter was the author's paramount consideration. His object was chiefly attained by the grouping together of all cases exhibiting the same phonetic or formative feature, no matter whether or not they belonged to the same part of speech. For this purpose he also makes use of a highly artificial and ingenious system of algebraic symbols, consisting of technical letters (*anubandhā*), used chiefly with suffixes, and indicative of the changes which the roots or stems have to undergo in word-formation.

It is self-evident that so complicated and complete a system of linguistic analysis and nomenclature could not have sprung up all at once and in the infancy of grammatical science, but that many generations of scholars must have helped to bring it to that degree of perfection which it exhibits in Pāṇini's work. Accordingly we find Pāṇini himself making reference in various places to ten different grammarians, besides two schools, which he calls the "eastern (*prācīnas*)" and "northern (*udācīnas*)" grammarians. Perhaps the most important of his predecessors was Śākatāyana,² also mentioned by Yāska—the author of the *Nirukta*, who is likewise supposed to have preceded Pāṇini—as the only grammarian (*vaiyākaraṇa*) who held with the etymologists (*nirukta*) that all nouns are derived from verbal roots. Unfortunately there is little hope of the recovery of his grammar, which would probably have enabled us to determine somewhat more exactly to what extent Pāṇini was indebted to the labours of his predecessors. There exists indeed a grammar in South Indian MSS., entitled *Sabdāmūśana*, which is ascribed to one Śākatāyana;³ but this has been proved⁴ to be the production of a modern Jaina writer, which, however, seems to be partly based on the original work, and partly on Pāṇini and others. Pāṇini is also called Dākṣiṇputra, after his mother Dākṣi. As his birthplace the village Salātura is mentioned, which was situated some few miles north-west of the Indus, in the country of the Gandhāras, whence later writers also call him Sālāturiya, the formation of which name he himself explains in his grammar. Another name sometimes applied to him is Sālanki. In the *Kāthāsaritāgāra*, a modern collection of popular tales mentioned above, Pāṇini is said to have been the pupil of Varsha, a teacher at Pātāliputra, under the reign of Nanda, the father (†) of Chandragupta (315–291 B.C.). The real date of the great grammarian is, however, still a matter of uncertainty. While Goldstücker⁵ attempted to put his date back to ante-Buddhist times (about the 7th century B.C.), Prof. Weber holds that Pāṇini's grammar cannot have been composed till some time after the invasion of Alexander the Great. This opinion is chiefly based on the occurrence in one of the Sūtras of the word *yavanānt*, in the sense of "the writing of the Yavanas (Ionians)," thus implying, it would seem, such an acquaintance with the Greek alphabet as it would be impossible to assume for any period prior to Alexander's Indian campaign (326 B.C.). But, as it is by no means certain⁶ that this term really applies to the Greek alphabet, it is scarcely expedient to make the word the corner-stone of the argument regarding Pāṇini's age. If Patañjali's "great commentary" was written, as seems highly probable, about the middle of the 2nd century B.C., it is hardly possible to assign to Pāṇini a later date than about 400 B.C. Though this grammarian registers numerous words and formations as peculiar to the Vedic hymns, his chief concern is with the ordinary speech (*bhāṣā*) of his period and its literature; and it is noteworthy, in this respect, that the rules he lays down on some important points of syntax (as pointed out by Profs. Bhandarkar and Kielhorn) are in accord with the practice of the Brāhmanas rather than with that of the later classical literature.

¹ Printed, with a commentary, at Calcutta; also, with notes, indexes, and an instructive introduction, by O. Böhtlingk.

² I.e., son of Śakata, whence he is also called Śakataṅga.

³ Compare O. Böhtlingk's paper, *Oriental Ind. Occident*, p. 691 sq.

⁴ A. Burnell, *On the Andhra School of Sanskrit Grammarians*.

⁵ Pāṇini, his place in Sanskrit Literature, 1861.

⁶ See Lassen, *Ind. Alt.*, t. 1, p. 723; M. Müller, *Hist. of A. S. Lit.*, p. 521; A. Weber, *Ind. Stud.*, v. p. 2 sq.

Pāṇini's Sūtras continued for ages after to form the centre of grammatical activity. But, as his own work had superseded those of his predecessors, so many of the scholars who devoted themselves to the task of perfecting his system have sunk into oblivion. The earliest of his successors whose work has come down to us (though perhaps not in a separate form), is Kātyāyana; the author of a large collection of concise critical notes, called *Vārttika*, intended to supplement and correct the Sūtras, or give them greater precision. The exact date of this writer is likewise unknown; but there can be little doubt that he lived at least a century after Pāṇini. During the interval a new body of literature seems to have sprung up,⁷—accompanied with considerable changes of language,—and the geographical knowledge of India extended over large tracts towards the south. Whether this is the same Kātyāyana to whom the Vājasaneyi-prātiśākhya (as well as the Sarvānukrama) is attributed, is still doubted by some scholars.⁸ Kātyāyana being properly a family or tribal name, meaning "the descendant of Kātya," later works usually assign a second name Vararuchi to the writers (for there are at least two) who bear it. The Kathāsaritāgāra makes the author of the *Vārttikas* a fellow-student of Pāṇini, and afterwards the minister of King Nanda; but, though this date might have fitted Kātyāyana well enough, it is impossible to place any reliance on the statements derived from such a source. Kātyāyana was succeeded again, doubtless after a considerable interval, by Patañjali, the author of the (*Vyākaraṇa*) *Mahābhāṣya*,⁹ or Great Commentary. For the great variety of information it incidentally supplies regarding the literature and manners of the period, this is, from an historical and antiquarian point of view, one of the most important works of the classical Sanskrit literature. Fortunately the author's date has been settled by synchronisms implied in two passages of his work. In one of them the use of the imperfect—as the tense referring to an event, known to people generally, not witnessed by the speaker, and yet capable of being witnessed by him—is illustrated by the statement, "The Yavana besieged Śāketa," which there is reason to believe can only refer to the Indo-Bactrian king Menander (144–c. 124 B.C.), who, according to Strabo, extended his rule as far as the Yamunā.¹⁰ In the other passage the use of the present is illustrated by the sentence, "We are sacrificing for Pushyamitra,"—this prince (178–c. 142 B.C.), the founder of the Sunga dynasty, being known to have fought against the Greeks.¹¹ We thus get the years 144–142 B.C. as the probable time when the work, or part of it, was composed. Although Patañjali probably gives not a few traditional grammatical examples mechanically repeated from his predecessors, those here mentioned are fortunately such as, from the very nature of the case, must have been made by himself. The Mahābhāṣya is not a continuous commentary on Pāṇini's grammar, but deals only with those Sūtras (some 1720 out of a total of nearly 4000) on which Kātyāyana had, proposed any *Vārttikas*, the critical discussion of which, in connexion with the respective Sūtras, and with the views of other grammarians expressed thereon, is the sole object of Patañjali's commentatorial remarks. Though doubts have been raised as to the textual condition of the work, Prof. Kielhorn has clearly shown that it has probably been handed down in as good a state of preservation as any other classical Sanskrit work. Patañjali is also called Gonardīya,—which name Prof. Bhandarkar takes to mean "a native of Gonarda," a place, according to the same scholar, probably identical with Gonḍa, a town some 20 miles north-west of Oudh,—and Gonikāputra, or son of Gonikā. Whether there is any connexion between this writer and the reputed author of the *Yogasāstra* is doubtful. The Mahābhāṣya has been commented upon by Kaiyata, in his *Bhāṣyapradīpa*, and the latter again by Nāgojibhatta, a distinguished grammarian of the earlier part of the last century, in his *Bhāṣya-pradīpodyota*.

Of running commentaries on Pāṇini's Sūtras, the oldest extant and most important is the *Kāśikā Vṛtti*,¹² or "comment of Kāśi (Benares)," the joint production of two Jaina writers of probably the first half of the 7th century, viz., Jayāditya and Vāmana, each of whom composed one half (four *adhyaīyas*) of the work. The chief commentaries on this work are Haradatta Miśra's *Padamāñjarī*, which also embodies the substance of the Mahābhāṣya, and Jinendra-buddhi's *Nyāsa*.¹³

Educational requirements in course of time led to the appearance of grammars, chiefly of an elementary character, constructed on a

⁷ F. Kielhorn, *Kātyāyana und Patañjali*, 1876. The *Sangraha*, a huge metrical work on grammar, by Vyādi, which is frequently referred to, doubtless belongs to this period.

⁸ E.g., A. Weber, Goldstücker and M. Müller take the opposite view.

⁹ Part of this work was first printed by Ballantyne; followed by a lithographed edition, by two Benares pandits, 1871; and a photo-lithographic edition of the text and commentaries, published by the India Office, under Goldstücker's supervision, 1874; finally, a critical edition, now in progress, by F. Kielhorn.

For a review of the literary and antiquarian data supplied by the work, see A. Weber, *Ind. Stud.*, xiii, 293 sq. The author's date has been frequently discussed, most thoroughly and successfully by R. G. Bhandarkar in several papers. See also A. Weber, *Hist. of I. L.*, p. 223. ¹⁰ Lassen, *Ind. Alt.*, ii, 341, 362.

¹¹ Edited by Pandit Bāla Śāstri, Benares, 1876–78.

¹² As it is quoted by Vopadeva, it cannot be later than the 12th century.

more practical system of arrangement—the principal heads under which the grammatical matter was distributed usually being—rules of euphony (*sandhi*); inflexion of nouns (*nāman*), generally including composition and secondary derivatives; the verb (*ākhyāta*); and primary (*krīd-anta*) derivatives. In this way a number of grammatical schools¹ sprang up at different times, each recognizing a special set of Sūtras, round which gradually gathered a more or less numerous body of commentarial and subsidiary treatises. As regards the grammatical material itself, these later grammars supply comparatively little that is not already contained in the older works,—the difference being mainly one of method, and partly of terminology, including modifications of the system of technical letters (*anubandha*). Of the grammars of this description hitherto known the *Chāndra-vyākaraṇa* is probably the oldest,—its author Chandra Āchārya having flourished under King Abhimanyu of Kashmir, who is usually supposed to have lived towards the end of the 2d century,² and in whose reign that grammarian is stated, along with others, to have revived the study of the Mahābhāṣya in Kashmir. Only portions of this grammar, with a commentary by Ānandadatta, have as yet been recovered. The *Kātantra*,³ or *Kāllapa*, is ascribed to Kumāra, the god of war, whence this school is also sometimes called *Kaunḍara*. The real author probably was Sarva-varman, who also wrote the original commentary (*vṛtti*), which was afterwards recast by Durgasiṃha, and again commented upon by the same writer, and subsequently by Trilochana-dāsa. The date of the Kātantra is unknown, but it will probably have to be assigned to about the 6th or 7th century. It is still used in many parts of India, especially in Bengal and Kashmir. Other grammars are—the *Sārasvatī Prakriyā*, by Anubhūti Svarṇpāchārya; the *Sankṣipta-sāra*, composed by Kramadīvara, and corrected by Jumara-nandin, whence it is also called *Jaumara*; the *Haima-vyākaraṇa*,⁴ by the Jaina writer Hemachandra (1088–1172, according to Dr Bhāo Dāji); the *Mugdha-bodha*,⁵ composed, in the latter part of the 13th century, by Vopadeva, the court poet of King Mahādeva (Rāmarāja) of Devagiri (or Deogarh); the *Siddhānta-kaumudī*, the favourite text-book of Indian students, by Bhaṭṭojī Dikṣita (17th century); and a clever abridgment of it, the *Laghu-Siddhānta-kaumudī*,⁶ by Varadarāja.

Several subsidiary grammatical treatises remain to be noticed. The *Paribhāṣās* are general maxims of interpretation presupposed by the Sūtras. Those handed down as applicable to Pāṇini's system have been interpreted most ably by Nāgojibhatta, in his *Paribhāṣendūsekharā*.⁷ In the case of rules applying to whole groups of words, the complete lists (*gaṇa*) of these words are given in the *Gaṇapāṭhī*, and only referred to in the Sūtras. Vardhamāna's *Gaṇaratna-mahodadhī*,⁸ a comparatively modern recension of these lists (1140 A.D.), is valuable as offering the only available commentary on the Gaṇas which contain many words of unknown meaning. The *Dhātupāṭhas* are complete lists of the roots (*dhātu*) of the language, with their general meanings. The lists handed down under this title,⁹ as arranged by Pāṇini himself, have been commented upon, amongst others, by Mādharma. The *Unādi-sūtras* are rules on the formation of irregular derivatives. The oldest work of this kind, commented upon by Ujjvaladatta,¹⁰ is by some writers ascribed to Kātyāyana Vararuchi, by others even to Śākatāyana. The oldest known treatise on the philosophy of grammar and syntax is the *Vākya-pāṭhya*,¹¹ composed in verse, by Bhartṛihari (†7th century), whence it is also called *Harikārikā*. Of later works on this subject, the *Vaiyākaraṇa-bhāṣana*, by Koṇḍabhatta, and the *Vaiyākaraṇa-siddhānta-mañjarī*, by Nāgojibhatta, are the most important.

IV. LEXICOGRAPHY.—Sanskrit dictionaries (*koṣha*), invariably composed in verse, are either homonymous or synonymous, or partly the one and partly the other. Of those hitherto published, Śāsvata's *Anekārtha-samucchaya*,¹² or "collection of homonyms," is probably the oldest. While in the later homonymic vocabularies the words are usually arranged according to the alphabetical order of the final (or sometimes the initial) letter, and then according to the number of syllables, Śāsvata's principle of arrangement—viz., the number of meanings assignable to a word—seems to be more primitive. The work probably next in time is the famous *Amara-koṣha*,¹³ ("immortal treasury") by Amara-siṃha, one of "the nine gems" at the court of King Vikramāditya (c. 550 A.D.). This dictionary consists of a synonymous and a short homonymous part; whilst in the former the words are distributed in sections

according to subjects, as heaven and the gods, time and seasons, &c., in the latter they are arranged according to their final letter, without regard to the number of syllables. This *Koṣha* has found many commentators, the oldest of those known being Kṣhira-svāmin.¹⁴ Among the works quoted by commentators as Amara's sources are the *Trikaṇḍa* and *Utpalini-koṣhas*, and the glossaries of Rabhasa, Vyādi, Kātyāyana, and Vararuchi. A *Koṣha* ascribed to Vararuchi,—whom tradition makes one of the nine literary "gems," and hence the contemporary of Amara-siṃha,—consisting of ninety short sections, has been printed at Benares (1865) in a collection of twelve *Koṣhas*. The *Abhidhāna-ratnamālā*,¹⁵ by Halayudha; the *Viśvapradāsa*, by Maheśvara (1111); and the *Abhidhāna-chintāmaṇi*¹⁶ (or *Haima-koṣha*), by the Jaina Hemachandra, seem all three to belong to the 12th century. Somewhat earlier than these probably is Ajaya Pāla, the author of the (homonymous) *Nādartha-sangraha*, being quoted by Vardhamāna (1140 A.D.). Of more uncertain date is Puruṣhottama Deva, who wrote the *Trikaṇḍa-śeṣha*, a supplement to the Amarakoṣha, besides the *Harivālī*, a collection of uncommon words, and two other short glossaries. Of numerous other works of this class the most important is the *Medinī*, a dictionary of homonyms, arranged in the first place according to the finals and the syllabic length, and then alphabetically. Two important dictionaries, compiled by native scholars of the present century, are the *Sabdakalpadrūpa* by Rādhākānta Deva, and the *Vāchaspatya*, by Tārānātha Tarka-vāchaspati. A full account of Sanskrit dictionaries is contained in the preface to the first edition of H. H. Wilson's *Dictionary*, reprinted in his *Essays on Sanskrit Literature*, vol. iii.

V. PROSODY (*Chhandas*).—The oldest treatises on prosody have already been referred to in the account of the technical branches of the later Vedic literature. Among more modern treatises the most important are the *Mṛita-sanjivani*, a commentary on Pingala's Sūtra, by Halayudha (perhaps identical with the author of the glossary above referred to); the *Vṛitta-ratnākara*, or "jewel-mine of metres," in six chapters, composed before the 13th century by Kedāra Bhatta, with several commentaries; and the *Chhando-mañjarī*, likewise in six chapters, by Gaṇādāsa. The *Srutabodha*, ascribed, probably wrongly, to the great Kālidāsa, is a comparatively insignificant treatise, dealing only with the more common metres, in such a way that each couplet forms a specimen of the metre it describes. The *Vṛitta-darpana* treats chiefly of Prakṛit metres. Sanskrit prosody, which is probably not surpassed by any other either in variety of metre or in harmoniousness of rhythm, recognizes two classes of metres, viz., such as consist of a certain number of syllables of fixed quantity, and such as are regulated by groups of breves or metrical instants, this latter class being again of two kinds, according as it is or is not bound by a fixed order of feet. A pleasant account of Sanskrit poetics is given in Colebrooke's *Essays*, vol. ii.; a more complete and systematic one by Prof. Weber, *Ind. Stud.*, vol. viii.

VI. MUSIC (*Sangīta*).—The musical art has been practised in India from early times. The theoretic treatises on profane music now extant are, however, quite modern productions. The two most highly esteemed works are the *Sangīta-ratnākara* ("jewel-mine of music"), by Śārngadeva, and the *Sangīta-darpana* ("mirror of music"), by Dāmodara. Each of these works consists of seven chapters, treating respectively of—(1) sound and musical notes (*svara*); (2) melodies (*rāga*); (3) music in connexion with the human voice (*prakṛitnāka*); (4) musical compositions (*prabandha*); (5) time and measure (*tāla*); (6) musical instruments and instrumental music (*vādya*); (7) dancing and acting (*nṛtta* or *nṛitya*). The Indian octave consists like our own of seven chief notes (*svara*); but, while with us it is subdivided into twelve semi-tones, the Hindu theory distinguishes twenty-two intervals (*śruti*, audible sound). There is, however, some doubt as to whether these *śrutis* are quite equal to one another,—in which case the intervals between the chief notes would be unequal, since they consist of either two or three or four *śrutis*,—or whether, if the intervals between the chief notes be equal, the *śrutis* themselves vary in duration between quarter-, third-, and semi-tones. There are three scales (*grāma*), differing from each other in the nature of the chief intervals (either as regards actual duration, or the number of *śrutis* or sub-tones). Indian music consists almost entirely in melody, instrumental accompaniment being performed in unison, and any attempt at harmony being confined to the continuation of the key-note. A number of papers, by various writers, have been reprinted with additional remarks on the subject, in Sourindro Mohun Tagore's *Hindu Music*, Calcutta, 1875. Compare also "Hindu Music," reprinted from the *Hindoo Patriot*, September 7, 1874.

VII. RHETORIC (*Alankāra-sāstra*).—Treatises on the theory of

¹ Dr Burnell, in his *Andhra School*, proposes to apply this term to all grammars arranged on this plan.

² Prof. Bhandarkar, *Early History of the Dehkan*, p. 20, proposes to fix him about the end of the 3d century.

³ Part ed. and transl. by R. Fischel. ⁴ Ed. by O. Böhtlingk, 1847.

⁵ Ed. and transl. by J. R. Ballantyne. For other modern grammars see Colebrooke, *Essays*, ii, p. 44; Rājendralāla Mitra, *Descriptive Catalogue*, 1, Grammar.

⁶ Ed. by J. Eggeling.

⁷ Text and commentary, ed. by Th. Aufrecht.

⁸ In course of publication, with commentaries, at Benares.

⁹ Ed. by Th. Zachariae.

¹⁰ Edited by H. T. Colebrooke (1808), and by L. Deslongchamps (1829–45).

¹⁴ A grammarian of this name is mentioned as the tutor of King Jayapīṭha of Kashmir (755–786 A.D.); but Kṣhira, the commentator on Amara is placed by Prof. Aufrecht between the 11th and 12th centuries, because he quotes the *Sabdāmūśana* ascribed to Bhojarāja.

¹⁵ Ed. by Th. Aufrecht (1861) ¹⁶ Ed. by O. Böhtlingk and C. Riou (1847)

literary composition are very numerous. Tāḍēd, a subject of this description—involving such nice distinctions as regards the various kinds of poetic composition, the particular subjects and characters adapted for them, and the different sentiments or mental conditions capable of being both depicted and called forth by them—could not but be congenial to the Indian mind. H. H. Wilson, in his *Theatre of the Hindus*, has given a detailed account of these theoretic distinctions with special reference to the drama, which, as the most perfect and varied kind of poetic production, usually takes an important place in the theory of literary composition. The *Bharata-sāstra* has already been alluded to as probably the oldest extant work in this department of literature. Another comparatively ancient treatise is the *Kāvya-darsa*,¹ or “mirror of poetry,” in three chapters, by Dandin, the author of the novel *Dasakumāracharita*, who probably flourished not long after Kālidāsa (whose Pākrit poem *Setubandha* he quotes) in the 6th century. The work consists of three chapters, treating—(1) of two different local styles (*riti*) of poetry, the Gaudī and the Vaidarbhī (to which later critics add four others, the Pāñchālī, Māgadhī, Lāṭī, and Avāntikā); (2) of the graces and ornaments of style, as tropes, figures, similes; (3) of alliteration, literary puzzles, and twelve kinds of faults to be avoided in composing poems. Another treatise on rhetoric, in Sūtras, with a commentary entitled *Kāvya-lankāra-vṛitti*, is ascribed to Vāmana. Prof. Cappeller, to whom we owe an edition of this work, is inclined to fix it as late as the 12th century; but it may turn out to be somewhat older. The *Kāvya-lankāra*, by the Kashmirian Rudrata, must have been composed prior to the 11th century, as a gloss on it (by Nami), which professes to be based on older commentaries, was written in 1063. Dhananjaya, the author of the *Dasarūpa*,² or “ten forms (of plays),” the favourite compendium of dramaturgy, appears to have flourished in the 10th century. In the concluding stanza he is stated to have composed his work at the court of King Muñja, who is probably identical with the well-known Mālava prince, the uncle and predecessor of King Bhoja of Dhārā. The *Dasarūpa* was early commented upon by Dhanika, possibly the author's own brother, their father's name being the same (Vishnu). Dhanika quotes Rājasekhara, who is supposed to have flourished about 1000 A.D.,³ but may after all have to be put somewhat earlier. The *Sarasvatī-kantābhāraṇa*, “the neck-ornament of Sarasvatī (the goddess of eloquence),” a treatise, in five chapters, on poetics generally, remarkable for its wealth of quotations, is ascribed to King Bhoja himself (11th century), probably as a compliment by some writer patronized by him. The *Kāvya-prakāśa*,⁴ “the lustre of poetry,” another esteemed work of the same class, in ten sections, was probably composed in the 12th century,—the author, Mammata, a Kashmirian, having been the maternal uncle of Śrī-Harsha, the author of the *Naishadhīya*. The *Śāhitya-darpana*,⁵ or “mirror of composition,” the standard work on literary criticism, was composed in the 15th century, on the banks of the Brahmaputra, by Viśvanātha Kavirāja. The work consists of ten chapters, treating of the following subjects:—(1) the nature of poetry; (2) the sentence; (3) poetic flavour (*rasa*); (4) the divisions of poetry; (5) the functions of literary suggestion; (6) visible and audible poetry (chiefly on dramatic art); (7) faults of style; (8) merits of style; (9) distinction of styles; (10) ornaments of style.

VIII. MEDICINE (*Āyur-veda*, *Vaidya-sāstra*).—Though the early cultivation of the healing art is amply attested by frequent allusions in the Vedic writings, it was doubtless not till a much later period that the medical practice advanced beyond a certain degree of empirical skill and pharmaceutical routine. From the simultaneous mention of the three humours (wind, bile, phlegm) in a vārttika to Pāṇini (v. 1, 38), some kind of humoral pathology would, however, seem to have been prevalent among Indian physicians several centuries before our era. The oldest existing work is supposed to be the *Charaka-saṃhitā*,⁶ a bulky cyclopaedia in ślokas, mixed with prose sections, which consists of eight chapters, and was probably composed some centuries after Christ. Of equal authority, but probably somewhat more modern, is the *Suśruta-saṃhitā*,⁷ which Suśruta is said to have received from Dhanvantari, the Indian Æsculapius, whose name, however, appears also among the “nine gems” (c. 550 A.D.). It consists of six chapters, and is likewise composed in mixed verse and prose,—the greater simplicity of arrangement, as well as some slight attention paid in it to surgery, betokening an advance upon Charaka. Both works are, however, characterized by great prolixity, and contain much matter which has little connexion with medicine. The late Prof. E. Haas, in two very suggestive papers,⁸ tried to show that the work of Suśruta

(identified by him with Socrates, so often confounded in the Middle Ages with Hippocrates) was probably not composed till after the Mohammedan conquest, and that, so far from the Arabs (as they themselves declare) having derived some of their knowledge of medical science from Indian authorities, the Indian *Vaidya-sāstra* was nothing but a poor copy of Greek medicine, as transmitted by the Arabs. But even though Greek influence may be traced in this as in other branches of Indian science, there can be no doubt,⁹ at any rate, that both Charaka and Suśruta were known to the Arab Rāzī (c. 932 A.D.), and to the author of the *Fihrist* (completed 987 A.D.), and that their works must therefore have existed, in some form or other, at least as early as the 9th century. Among the numerous later medical works the most important general compendiums are Vāgbhata's *Aśhāṅga-hṛūdaya*, “the heart of the eight-limbed (body of medical science),” and Bhāva Mīśra's *Bhāva-prakāśa*; while of special treatises may be mentioned Mādha's system of nosology, the *Rugvinīśhaya*, or *Mādha-nā-nidāna*, and Śārṅgadharā's compendium of therapeutics, the *Sārṅgadharā-saṃhitā*. Materia medica, with which India is so lavishly endowed by nature, is a favourite subject with Hindu medical writers,—the most valued treatise being the *Rāja-nighāntu*, by the Kashmirian Narahari. The best general view of this branch of Indian science is contained in T. A. Wise's *Commentary on Hindu Medicine*, 1845, and in his *History of Medicine*, vol. i., 1867; but the whole subject, including the principal original works, still awaits a critical investigation.

IX. ASTRONOMY AND MATHEMATICS.—Hindu astronomy may be broadly divided into a pre-scientific and a scientific period. While the latter clearly presupposes a knowledge of the researches of Hipparchus and other Greek astronomers, it is still doubtful whether the earlier astronomical and astrological theories of Indian writers were entirely of home growth or partly derived from foreign sources. From very ancient (probably Indo-European) times chronological calculations were based on the synodical revolutions of the moon,—the difference between twelve such revolutions (making together 354 days) and the solar year being adjusted by the insertion, at the time of the winter solstice, of twelve additional days. Besides this primitive mode the Rīgveda also alludes to the method prevalent in post-Vedic times, according to which the year is divided into twelve (*sāvāna* or solar) months of thirty days, with a thirteenth month intercalated every fifth year. This quinquennial cycle (*yuga*) is explained in the *Jyotiṣha*, regarded as the oldest astronomical treatise. An institution which occupies an important part in those early speculations is the theory of the so-called lunar zodiac, or system of lunar mansions, by which the planetary path, in accordance with the duration of the moon's rotation, is divided into twenty-seven or twenty-eight different stations, named after certain constellations (*nakshatra*) which are found alongside of the ecliptic, and with which the moon (masc.) was supposed to dwell successively during his circuit. The same institution is found in China and Arabia; but it is still doubtful¹⁰ whether the Hindus, as some scholars hold, or the Chaldeans, as Prof. Weber thinks, are to be credited with the invention of this theory. The principal works of this period are hitherto known from quotations only, viz., the *Gārgī Saṃhitā*, which Prof. Kern would fix at c. 50 B.C., the *Nirādi Saṃhitā*, and other

The new era, which the same scholar dates from c. 250 A.D., is marked by the appearance of the five original Siddhāntas (partly extant in revised redactions and in quotations), the very names of two of which suggest Western influence, viz., the *Pañḍināha-Sārya*,¹¹ *Vasishṭha-Romaka* (i.e., Roman), and *Paulīśa-siddhāntas*. Based on these are the works of the most distinguished Indian astronomers, viz., Āryabhata,¹² probably born in 476; Varāha-mihira,¹³ probably 505-507; Brahmagupta, who completed his *Brahma-siddhānta* in 628; Bhāta Utpala (10th century), distinguished especially as commentator of Varāha-mihira; and Bhāskara Āchārya, who finished his great course of astronomy, the *Siddhānta-sīromani*, in 1150. In the works of several of these writers, from Āryabhata onwards, special attention is paid to mathematical (especially arithmetical and algebraic) computations; and the respective chapters of Bhāskara's compendium, viz., the *Līlāvāṭī* and *Vija-gaṇita*,¹⁴ still form favourite textbooks of these subjects. The question whether Āryabhata was acquainted with the researches of the Greek algebraist Diophantus (c. 360 A.D.) remains still unsettled; but, even if this was the case, algebraic science seems to have been carried by him beyond the point attained by the Greeks. (J. E.)

⁹ See Prof. Aug. Müller's paper, *Z. D. M. G.*, 1880, p. 465.
¹⁰ See especially Prof. Whitney's essay on the Lunar Zodiac, in his *Oriental and Linguistic Studies*.

¹¹ The *Sārya-siddhānta*, translated by (W. D. Whitney and) E. Burgess, 1860.

¹² The *Āryabhatīya*, edited by H. Kern, 1874.

¹³ The *Bṛhat-saṃhitā* and *Jyotiṣha*, edited and translated by H. Kern; the *Laṅkā-jātaka*, edited by A. Weber and H. Jacobi.

¹⁴ A translation of both treatises, as well as of the respective chapters of Brahmagupta's work, was published (1817) by H. T. Colebrooke, with an important “Dissertation on the Algebra of the Hindus,” reprinted in the *Misc. Essays*, II. p. 374 sq.

SANSON, NICOLAS (1600-1667), a French cartographer, who, while it is a mistake to call him the creator of French geography, attained a great and well-deserved eminence in his profession. He was born of an old Picardy family of Scottish descent, at Abbeville, on December 20, 1600, and was educated by the Jesuits at Amiens. The mercantile pursuit by which he first sought to make his living proved a failure, but in 1627 he was fortunate enough to attract the attention of Richelieu by a map of Gaul which he had constructed while still in his teens, and through the cardinal's influence he was appointed royal engineer in Picardy and geographer to the king. How highly his services were appreciated by his royal patrons is shown by the fact that when Louis XIII. came to Abbeville he preferred to become the guest of Sanson (then employed on the fortifications), instead of occupying the sumptuous lodgings provided by the town. Sanson's success was embittered by a quarrel with the Jesuit Labbe, whom he accused of plagiarizing him in his *Pharus Gallix Antiquæ*; and by the death of his eldest son Nicolas, killed during the disturbances of the Fronde (1648). He died at Paris July 7, 1667. Two younger sons, Adrien (died 1708) and Guillaume (died 1703), succeeded him as geographers to the king.

Sanson's principal works are *Gallix Antiquæ Descriptio Geographica*, 1627; *Britannia*, 1638, in which he seeks to identify Strabo's Britannia with Abbeville (1); *La France*, 1644; *In Pharum Gallix Antiquæ Philippi Labbe Disquisitiones*, 1647-1648; and *Geographia Sacra*. In 1692 Jaillot collected Sanson's maps in an *Atlas Nouveau*. His cartography is generally bold and vigorous.

SANSOVINO, ANDREA CONTUCCI DEL MONTE (1460-1529), an able Florentine sculptor, who lived during the rapid decline of plastic art which took place from about the beginning of the 16th century; he was the son of a shepherd called Niccolò di Domenico Contucci, and was born in 1460 at Monte Sansavino near Arezzo, whence he took his name, which is usually softened to Sansovino. He was a pupil of Antonio Pollajuolo, and during the first part of his life worked in the purer style of 15th-century Florence. Hence his early works are by far the best, such as the terra-cotta altar-piece in Santa Chiara at Monte Sansavino, and the marble reliefs of the Annunciation, the Coronation of the Virgin, a Pietà, the Last Supper, and various statuettes of saints and angels in the Corbinelli chapel of S. Spirito at Florence, all executed between the years 1488 and 1492. From 1491 to 1500 Andrea worked in Portugal for the king, and some pieces of sculpture by him still exist in the monastic church of Coimbra.¹ These early reliefs show strongly the influence of Donatello. The beginning of a later and more pagan style is shown in the statues of St John baptizing Christ which are over the east door of the Florentine baptistery. This group was, however, finished by the weaker hand of Vincenzo Danti. In 1502 he executed the marble font at Volterra, with good reliefs of the Four Virtues and the Baptism of Christ. In 1505 Sansovino was invited to Rome by Julius II. to make the monuments of Cardinal Ascanio Maria Sforza and Cardinal Girolamo della Rovere for the retro-choir of S. Maria del Popolo. The architectural parts of these monuments and their sculptured foliage are extremely graceful and executed with the most minute delicacy, but the recumbent effigies show the beginning of a serious decline in taste. Though skilfully modelled, they are uneasy in attitude, and have completely lost the calm dignity and simple lines of the earlier effigies, such as those of the school of Mino da Fiesole in the same church. These tombs had a very important influence on the monumental sculpture of the time, and became models

¹ See Raczinski, *Les Arts en Portugal*, Paris, 1846, p. 344.

which for many years were copied by most later sculptors with increasing exaggerations of their defects. In 1513, while still in Rome, Sansovino executed a very beautiful group which shows strongly the influence of Leonardo da Vinci, both in the pose and in the sweet expression of the faces; it is a group of the Madonna and Child with St Anne, now over one of the side altars in the church of S. Agostino. From 1513 to 1528 he was at Loreto, where he cased the outside of the Santa Casa in white marble, covered with reliefs and statuettes in niches between engaged columns; a small part of this gorgeous mass of sculpture was the work of Andrea himself, but the greater part was executed by Montelupo, Tribolo, and others of his numerous school of assistants and pupils. Though the general effect of the whole is very rich and magnificent, the individual pieces of sculpture are both dull and feeble, showing the unhappy results of an attempt to imitate Michelangelo's grandeur of style. The earlier reliefs, those by Sansovino himself, are the best, still retaining some of the sculpturesque purity of the older Florentines. He died in 1529.

SANSOVINO, JACOPO (1477-1570), was called Sansovino after his master Andrea (see above), his family name being Tatti. Born in 1477, he became a pupil of Andrea in 1500, and in 1510 accompanied him to Rome, devoting himself there to the study of antique sculpture. Julius II. employed him to restore damaged statues, and while working in the Vatican he made a full-sized copy of the Laocoon group, which was afterwards cast in bronze, and is now in the Uffizi at Florence. In 1511 he returned to Florence, and began the statue of St James the Elder, which is now in a niche in one of the great piers of the Duomo. Under the influence of his studies in Rome he carved a nude figure of Bacchus and Pan, now in the Bargello, near the Bacchus of Michelangelo, from the contrast with which it suffers much. Soon after the completion of these works, Jacopo returned to Rome, and designed for his fellow-citizens the grand church of S. Giovanni dei Fiorentini, which was afterwards carried out by Antonio Sangallo the younger. A marble group of the Madonna and Child, now at the west of S. Agostino, was his next important work. It is heavy in style, and quite without the great grace and beauty of the Madonna and St Anne in the same church by his master Andrea. In 1527 Jacopo fled from the sack of Rome to Venice, where he was welcomed by his friends Titian and Pietro Aretino; henceforth till his death in 1570 he was almost incessantly occupied in adorning Venice with a vast number of magnificent buildings and many second-rate pieces of sculpture. Among the latter Jacopo's poorest works are the colossal statues of Neptune and Mars on the grand staircase of the ducal palace, from which it is usually known as the “Giants' Staircase.” His best are the bronze doors of the sacristy of St Mark, cast in 1562; inferior to these are the series of six bronze reliefs round the choir of the same church, attempted imitations of Ghiberti's style, but unquiet in design and unsplendourous in treatment. In 1565 he completed a small bronze gate with a graceful relief of Christ surrounded by Angels; this gate shuts off the altar of the Reserved Host in the choir of St Mark's.

Jacopo's chief claim to real distinction rests upon the numerous fine Venetian buildings which he designed, such as the public library, the mint, the Scuola della Misericordia, the Palazzo de' Cornari, and the Palazzo Delfino, with its magnificent staircase,—the last two both on the grand canal; a small loggia which he built at the foot of the great Campanile, richly decorated with sculpture, has recently been pulled down and much damaged, but is being rebuilt. Among his ecclesiastical works the chief are the church of S. Fantino, that of S. Martino, near the