

*Redeemer, The most Sacred Resurrection of Christ, and pastoral plays (Eglogas), as The Knight turned Shepherd, The Shepherds become Courtiers, The Triumph of Love.* Seven of the number are reprinted in Bohl de Faber, *Teatro español*, Hamburg, 1832. After the author's death there appeared in 1556 without rubric, *Documento e instrucción para las doncellas desposadas y recién casadas con una justa d' amores.* See Barrera, *Catálogo del Teatro antiguo español*.

ENCKE, JOHANN FRANZ (1791–1865), a celebrated astronomer, was born at Hamburg on the 23d September 1791. He received his early education from his father, who was a clergyman, and he afterwards studied at the university of Göttingen, devoting himself specially to astronomy under the instruction of Professor Gauss. In 1813–14 he served in the Hanseatic legion in the war with Napoleon, and in 1815 he became a lieutenant of artillery in the Prussian service. When peace was concluded he resumed his astronomical studies at Göttingen until 1817, when he was appointed by Lindenau the Saxon minister of state to a post in the Observatory of Seeberg, near Gotha. In 1822–3 he published at Gotha two volumes, entitled *Die Entfernung der Sonne*, in which the various observations of the transits of Venus in 1761 and 1769 were carefully reconsidered, and the calculations verified and corrected. One of the earliest subjects to which his attention was directed was the determination of the orbit of the comet observed by Pons at Marseilles in November 1818. He calculated the period of its recurrence at about three and a quarter years, and conjectured it to be the

same comet that had appeared in 1786, 1795, and 1805. Upon the data he possessed he was able to predict its re-appearance in 1822, and he stated also that it would probably be invisible in Europe. His prediction was almost exactly verified, the comet being observed in New South Wales on the 3d June 1822, and the time of its perihelion passage being within three hours of that which he had computed. From the elements supplied by this observation he was able to foretell more accurately its recurrences in 1825 and 1828, and after the latter of these he determined its exact orbit. After the observation of 1832 he determined the period of its revolution as 3.29 years, with a gradual acceleration which he ascribed to the existence of a resisting medium. The comet is known as Encke's comet. In 1825 Encke was appointed to succeed Bode as director of the Royal Observatory at Berlin, a situation which he filled with great ability until within a year of his death. In 1830 he became editor of the Berlin *Astronomisches Jahrbuch*, to which he contributed a large number of valuable papers. The observations taken under his direction at the Berlin Observatory were recorded and published in a series of volumes, of which the first appeared in 1840. Of his many other contributions to astronomical literature may be mentioned his new method for computing perturbations, his dissertation *De Formulæ Dioptricis* (1845), and his work on the relation of astronomy to the other sciences, which was published in 1846. Encke was one of the foreign members of the Royal Society of London, and in 1840 he was created a knight by the king of Prussia. He died at Spandau on September 2, 1865.

## ENCYCLOPÆDIA

THE Greeks seem to have understood by encyclopædia (ἐγκυκλοπαιδεία, or ἐγκύκλιος παιδεία) instruction in the whole circle or complete system of learning—education in arts and sciences. Thus Pliny, in the preface to his *Natural History*, says that his book treated of all the subjects of the encyclopædia of the Greeks, "Jam omnia attingenda quæ Græci τῆς ἐγκυκλοπαιδείας vocant." Quintilian (*Inst. Orat.*, i. 10) directs that before boys are placed under the rhetorician they should be instructed in the other arts, "ut efficiatur orbis ille doctrinæ quam Græci ἐγκυκλοπαιδείαν vocant." Galen (*De victus ratione in morbis acutis*, c. 11) speaks of those who are not educated ἐν τῇ ἐγκυκλοπαιδείᾳ. In these passages of Pliny and Quintilian, however, from one or both of which the modern use of the word seems to have been taken, ἐγκύκλιος παιδεία is now read, and this seems to have been the usual expression. Vitruvius (lib. vi. præf.) calls the encyclos or ἐγκύκλιος παιδεία of the Greeks "doctrinarum omnium disciplina," instruction in all branches of learning. Strabo (lib. iv. cap. 10) speaks of philosophy καὶ τὴν ἄλλην παιδείαν ἐγκύκλιον. Tzetzes (*Chiliades*, xi. 527), quoting from Porphyry's *Lives of the Philosophers*, says that ἐγκύκλια μαθήματα was the circle of grammar, rhetoric, philosophy, and the four arts under it, arithmetic, music, geometry, and astronomy. Zonaras explains it as grammar, poetry, rhetoric, philosophy, mathematics, and simply every art and science (ἀπλῶς πᾶσα τέχνη καὶ ἐπιστήμη), because sophists go through them as through a circle. The idea seems to be a complete course of instruction in all parts of knowledge. An epic poem was called cyclic when it contained the whole mythology; and among physicians κύκλος θεραπεύειν, cyclo curare (Vegetius, *De Arte Veterinaria*, ii. 5, 6), meant a cure effected by a regular and prescribed course of diet and medicine (see Wower, *De Polymathia*, c. 24, § 14). The word encyclopædia was probably first used in English by Sir Thomas Elyot. "In an orator is required to be a

heaps of all manner of lernyng: whiche of some is called the worlde of science, of other the circle of doctrine, whiche is in one worde of greke Encyclopædia."—*The Governour*, bk. i. chap. xiii. In his Latin dictionary, 1538, he explains "Encyclos et Encyclica, the cykle or course of all doctines," and "Encyclopædia, that lernynge whiche comprehendeth all lyberall science and studies." The term does not seem to have been used as the title of a book by the ancients or in the Middle Ages. The edition of the works of Joachimus Fortius Ringelbergius, printed at Basel in 1541, is called on the title-page *Lucubrations vel potius absolutissima κυκλοπαιδεία*. Paulus Scalichius de Lika, an Hungarian count, wrote *Encyclopædia seu Orbis Disciplinarum Epistemon*, Basileæ, 1599, 4to. Alsted published in 1608 *Encyclopædia Cursus Philosophici*, which he afterwards expanded into his great work, first published in 1620, called without any limitation *Encyclopædia*, because it treats of everything that can be learned by man in this life. This is now the most usual sense in which the word encyclopædia is used—a book treating of all the various kinds of knowledge, and it has become in modern times the common title of such books. Cyclopædia was formerly sometimes used, but is now retained only in English, and is not merely without any appearance of classical authority, but is etymologically less definite, complete, and correct. For as Cyropædia means "the instruction of Cyrus," so cyclopædia may mean "instruction of a circle." Vossius says, "Cyclopædia is sometimes found, but the best writers say encyclopædia" (*De Vitiis Sermonis*, 1645, p. 402). Gesner says, "κύκλος est circulus, quæ figura est simplicissima et perfectissima simul: nam incipi potest ubicunque in illa et ubicunque coheret. Cyclopædia itaque significat omnem doctrinarum scientiam inter se coherere. Encyclopædia est institutio in illo circulo." (*Isagoge*, 1774, i. 40.) In a more restricted sense, encyclopædia means a system or classification of the various branches of

knowledge, a subject on which many books have been published, especially in Germany, as Schmid's *Allgemeine Encyclopædie und Methodologie der Wissenschaften*, Jena, 1810, 4to, 241 pages. In this sense the *Novum Organum* of Bacon has often been called an encyclopædia. But it is "a grammar only of the sciences: a cyclopædia is not a grammar, but a dictionary; and to confuse the meanings of grammar and dictionary is to lose the benefit of a distinction which it is fortunate that terms have been coined to convey" (*Quarterly Review*, cxiii. 354). Fortunius Licetus, an Italian physician, entitled several of his dissertations on Roman altars and other antiquities *encyclopædia* (as, for instance, *Encyclopædia ad Aram mysticam Nonarii*, Patavia, 1631, 4to), because in composing them he borrowed the aid of all the sciences. The *Encyclopædia Moralis* of Marcellinus de Pise, Paris, 1646, fol. 4 vols., is a series of sermons. Encyclopædia is often used to mean a book which is, or professes to be, a complete or very full collection or treatise relating to some particular subject, as Blaine's excellent work, *The Encyclopædia of Rural Sports*, London, 1852, 8vo; *The Encyclopædia of Wit*, London, 1803, 12mo; *The Vocal Encyclopædia*, London, 1807, 16mo, a collection of songs, catches, &c. The word is more frequently used for an alphabetical dictionary treating fully of some science or subject, as Murray, *Encyclopædia of Geography*, London, 1834, 8vo; Lefebvre Laboulaye, *Encyclopédie Technologique: Dictionnaire des Arts et Manufactures*, Paris, 1845–47, 8vo, 2 vols.; Holtzendorff, *Encyclopædie der Rechtswissenschaft*, Leipzig, 1870, &c., 8vo.

The most ancient encyclopædia extant is Pliny's *Natural History* in 37 books (including the preface) and 2493 chapters, which may be thus described generally:—book 1, preface; book 2, cosmography, astronomy, and meteorology; books 3 to 6, geography; books 7 to 11, zoology, including man, and the invention of the arts; books 12 to 19, botany; books 20 to 32, medicines, vegetable and animal remedies, medical authors, and magic; books 33 to 37, metals, fine arts, mineralogy, and mineral remedies. Pliny, who died 79 A.D., was not a naturalist, a physician, or an artist, and collected his work in his leisure intervals while engaged in public affairs. He says it contains 20,000 facts (too small a number by half, says Lemaire), collected from 2000 books by 100 authors. Hardouin has given a list of 464 authors quoted by him. His work was a very high authority in the Middle Ages, and 43 editions of it were printed before 1536.

Martianus Minseus Felix Capella, an African, wrote about 470, in mingled verse and prose, a sort of encyclopædia, which is important from having been regarded in the Middle Ages as a model storehouse of learning, and used in the schools, where the scholars had to learn the verses by heart, as a text-book of high class education in the arts. It is sometimes entitled *Satyra*, or *Satyricon*, but is usually known as *De Nuptiis Philologie et Mercurii*, though this title is sometimes confined to the first two books, a rather confused allegory ending with the apotheosis of Philologia and the celebration of her marriage in the milky way, where Apollo presents to her the seven liberal arts, who, in the succeeding seven books, describe their respective branches of knowledge, namely, grammar, dialectics (divided into metaphysics and logic), rhetoric, geometry (geography, with some single geometrical propositions), arithmetic (chiefly the properties of numbers), astronomy, and music (including poetry). The style is that of an African of the 5th century, full of grandiloquence, metaphors, and strange words. He seldom mentions his authorities, and sometimes quotes authors whom he does not at all seem to have read. His work was frequently copied in the Middle Ages by ignorant transcribers, and was eight times printed from

1499 to 1599. The best annotated edition is by Kopp, Frankfurt, 1836, 4to, and the most convenient and the best text is that of Eyssenstadt, Lipsiæ, 1866, 8vo.

Isidore, bishop of Seville from 600 to 630, wrote *Etymologiarum libri XX.* (often also entitled his *Origines*) at the request of his friend Braulio, bishop of Saragossa, who after Isidore's death divided the work into books, as it was left unfinished, and divided only into titles.

The tenth book is an alphabet of 625 Latin words, not belonging to his other subjects, with their explanations as known to him, and often with their etymologies, frequently very absurd. The other books contain 448 chapters, and are:—1, grammar (Latin); 2, rhetoric and dialectics; 3, the four mathematical disciplines—arithmetic, geometry, music, and astronomy; 4, medicine; 5, laws and times (chronology), with a short chronicle ending in 627; 6, ecclesiastical books and offices; 7, God, angels, and the orders of the faithful; 8, the church and sects; 9, languages, society, and relationships; 11, man and portents; 12, animals, in eight classes, namely, pecora et jumenta, beasts, small animals (including spiders, crickets, and ants), serpents, worms, fishes, birds, and small winged creatures, chiefly insects; 13, the world and its parts; 14, the earth and its parts, containing chapters on Asia, Europe, and Libya, that is, Africa; 15, buildings, fields, and their measures; 16, stones (of which one is echo) and metals; 17, de rebus rusticis; 18, war and games; 19, ships, buildings, and garments; 20, provisions, domestic and rustic instruments.

Isidore appears to have known Hebrew and Greek, and to have been familiar with the Latin classical poets, but he is a mere collector, and his derivations given all through the work are not unfrequently absurd, and, unless when very obvious, will not bear criticism. He seldom mentions his authorities except when he quotes the poets or historians. Yet his work was a great one for the time, and for many centuries was a much valued authority and a rich source of material for other works, and he had a high reputation for learning both in his own time and in subsequent ages. His *Etymologies* were often imitated, quoted, and copied. MSS. are very numerous: Antonio (whose editor, Bayer, saw nearly 40) says, "plures passimque reperuntur in bibliothecarum angulis." This work was printed nine times before 1529.

Hrabanus Maurus, whose family name was Magnentius, was educated in the abbey of Fulda, ordained deacon in 802 ("Annales Francorum" in Bouquet, *Historiens de la France*, v. 66), sent to the school of St Martin of Tours then directed by Alcuin, where he seems to have learned Greek, and is said by Trithemius to have been taught Hebrew, Syriac, and Chaldee by Theophilus an Ephesian. In his *Commentaries on Joshua* (lib. ii. c. 5), he speaks of having resided at Sidon. He returned to Fulda and taught the school there. He became abbot of Fulda in 822, resigned in April 842, was ordained archbishop of Mayence 26th July 847, and died 4th February 856. He compiled an encyclopædia *De universo* (also called in some MSS. *De universali natura, De natura rerum, and De origine rerum*) in 22 books and 325 chapters. It is chiefly a re-arrangement of Isidore's *Etymologies*, omitting the first four books, half of the fifth, and the tenth (the seven liberal arts, law, medicine, and the alphabet of words), and copying the rest, beginning with the seventh book, verbally, though with great omissions, and adding (according to Ritter, *Geschichte der Philosophie*, vii. 193, from Alcuin, Augustine, or some other accessible source) the meanings given in the Bible to the subject matter of the chapter; while things not mentioned in Scripture, especially such as belong to classical antiquity, are omitted, so that his work seems to be formed of two alternating parts. His arrangement of beginning with God and the angels long prevailed in methodical encyclopædias. His last six books follow very closely the order of the last five of Isidore, from which they are taken. His omissions are characteristic of the diminished literary activity and more contracted knowledge of his time. His work was presented to Louis the German.

king of Bavaria, at Hersfeld in October 847, and was printed in 1473, fol., probably at Venice, and again at Strasburg by Mentelin about 1472-75, fol., 334 pages.

Michael Constantine Psellus, the younger, wrote *Δασκαλία παντοδμή*, dedicated to the emperor Michael Ducas, who reigned 1071-78. It was printed by Fabricius in his *Bibliotheca Græca*, 1712, vol. v., in 186 pages 4to and 193 chapters, each containing a question and answer. Beginning with divinity, it goes on through natural history and astronomy, and ends with chapters on excessive hunger, and why flesh hung from a fig-tree becomes tender. As collation with a Turin MS. showed that 35 chapters were wanting, Harles has omitted the text in his edition of Fabricius, and gives only the titles of the chapters (x. 84-88).

The author of the greatest encyclopædia of the Middle Ages, Vincentius Bellovacensis, or Belvacensis, most probably a native of Beauvais or of the Beauvaisis, was a Dominican friar, called by Louis IX. of France, on his founding Royaumont, a Cistercian monastery, in 1228, to fill the office of lector. He seems also to have been royal librarian, and Louis IX. paid for copying and buying many books for him. Fifteen different dates from 1240 to 1334 have been proposed for his death, but the most probable and the best supported by evidence seems to be 1264. His great work, called *Bibliotheca mundi*, or *Speculum majus*, *quadruplex*, or *triplex*, is only the third part of what he had prepared and abridged "ad fratrum preces et consilium prelati." The edition of 1624 contains 4327 folio pages of very small type. That the work excited great attention, and was much used at all times, is proved by the great number of MSS. in all libraries, of which nearly 80 have been described; though no general notice of them has been published. In his prologue or general preface, which is prefixed to each of the three genuine parts, he says it is called *Speculum* because it briefly contains almost everything he could collect from innumerable books which is worthy of speculation, that is, of admiration or imitation, done or said in the visible and invisible world from the beginning to the end, and even future things. He was so anxious that the names of the authors quoted should not be lost or transposed in copying that he wrote them, not on the margin, but in the text itself, "inter lineas ipsas sicut in decretis;" therefore Thomasius (*De Plagio*, 542-75) acquits him of plagiarism, because he represents his work as a collection, and acknowledges all quotations.

The *Speculum Majus* describes—first, natural things; secondly, human doctrines, grammatical, literary, moral and political, including jurisprudence, mathematics, and physics; thirdly, ancient history, sacred and profane, with modern history, civil, literary, and, above all, ecclesiastical. To these three genuine parts a fourth was added, called *Speculum morale*. The first part, *Speculum naturale* finished in 1250, called in some MSS. *Speculum in Hexameron*, because arranged according to the order of the creation, contains 32 books and 3718 chapters. Book 1 treats of the creator and the angels; 2 the sensible world and the work of the first day, including light, colours, and demons; 3, second day, the firmament; 5 to 14, the third day,—book 5 waters, 6 the earth, 7 minerals and metals, 9-14 botany, containing eight alphabetical lists, aromatic plants (Absinthium to Erigeron) 198 names, cultivated plants (Abrotanum to Zinziber) 112 names, the others much shorter; book 15, fourth day, astronomy and technical chronology; book 16, fifth day, birds; book 17 fishes (list of 98 names, including sepiæ, spongia), and marine monsters (45 names); books 18 to 22, sixth day, animals; 23 to 28, man; 29, de universo, relating to the operations of the Creator since the creation, miracles, original sin, &c. The last three books form a sort of appendix:—book 30, nature of things; 31, natural history of human life; 32, places and times. The second part, *Speculum doctrinale*, contains 17 books and 2374 chapters; book 1, the fall, studies, doctors, words, with an alphabetical dictionary of about 2300 words, *Abavus* to *Zodia*; book 2, a very full grammar, with 45 chapters on verbs; book 3, logic, rhetoric, and poetry (with 29 fables); 4, 5, monastic science; 6, economic science; 7, politics; 8, legal actions; 9, 10, crimes; 11, mechanical arts; 12, practical medicine; 13, 14, theoretic medicine; 15, physics; 16,

mathematics, including metaphysics; 17, theology. Vincent had an accurate knowledge of Arabic figures and of the decimal notation, and his book was probably the first written in France in which they were explained. He does not mention mechanics or optics by name. The third part, *Speculum morale*, is undoubtedly not by Vincent de Beauvais. It was written, according to Quetif, between 1310 and 1325, and is not mentioned in the prologue in any MS. written before 1310, in which the division of the work is said to be threefold, and the *Speculum historiale* is called the third part, and not the fourth, as it is in the later MSS. No MS. of the *Speculum morale* contains the prologue. It is divided into 3 books and 347 distinctions, subdivided into articles. Scholastic arguments are more frequent, authors rarely named, and contradictory doctrines placed together. It is chiefly taken from Peter de Tarentasia on the *Sentences of Peter Lombard*, Stephen de Borbone on the *Seven Gifts of the Spirit*, Richard de Middleton, the anonymous *De consideratione novissimorum*, and, above all, from the *Summa Theologiae* of Thomas Aquinas. The fourth part, *Speculum historiale*, in 31 books and 3793 chapters, contains a history of the world from the creation to 1254, with 24 chapters on the death of men, the end of the world, which he places with St Hildegard in 2376 A.D., the reign of Antichrist, the last judgment, and the renewal of the universe. In more ancient times his chief guides are Peter Comestor (died 1178) and the Cistercian Helinand (died 1223). He mentions Turpin as the principal historian of Charlemagne. No one, says Quetif, has written the history of his time with more accuracy and truth, and greater freedom from all flattery. Jacob Van Maerlant translated this *Speculum* into Flemish verse, and continued it to 1273. A French translation was made by Jean de Vignay (a canon hospitaller of St Jacques du Hautpas, who died in 1341), at the request of Joanna of Burgundy, queen of Philip VI. of France, and printed by Verard, Paris, 1495-6, fol. 5 vols.

Vincent de Beauvais has preserved several works of the Middle Ages, and gives extracts from many lost classics and valuable readings of others, and has done more than any other mediæval writer to awaken a taste for classical literature. Fabricius (*Bibl. Græca*, 1728, xiv. pp. 107-25) has given a list of 328 authors, Hebrew, Arabic, Greek, and Latin, quoted in the *Speculum naturale*. To these should be added about 100 more for the *doctrinale* and *historiale*. As he did not know Greek or Arabic, he used Latin translations. The best edition of the *Speculum majus* is the first, printed at Strasburg, by Mentelin, 1469? to 1473, fol. 10 vols. The three Venice editions of 1484, 1493-4, and 1591, fol. 4 vols., are very imperfect and incorrect. The last edition, Duaci, 1624, fol. 4 vols., by the Benedictines of St Vaast of Arras, is equally incorrect, and Vincent's readings of ancient texts are replaced by the current readings of the time.

Brunetto Latini of Florence (born 1230, died 1294), the master of Dante and Guido Cavalcanti, while an exile in France between 1260 and 1267, wrote in French *Li Livres dou Tresor*, in 3 books and 413 chapters. Book i. contains the origin of the world, the history of the Bible and of the foundation of governments, astronomy, geography, and lastly natural history, taken from Aristotle, Pliny, and the old French Bestiaries. The first part of Book ii., on morality, is from the *Ethics* of Aristotle, which Brunetto had translated into Italian. The second part is little more than a copy of the well-known collection of extracts from ancient and modern moralists, called the *Moralities of the Philosophers*, of which there are many MSS. in prose and verse. Book iii., on politics, begins with a treatise on rhetoric, chiefly from Cicero *De Inventione*, with many extracts from other writers and Brunetto's remarks. The last part, the most original and interesting of all, treats of the government of the Italian republics of the time. Like many of his contemporaries, Brunetto revised his work, so that there are two editions, the second made after his return from exile. MSS. are singularly numerous, and exist in all the dialects then used in France. Others were written in Italy. It was translated into Italian in the latter part of the 13th century by Bono Giamboni, and was printed at Trevigi, 1474, fol.; Venice, 1528 and 1533. The *Tesoro* of Brunetto must not be confounded with his *Tesoretto*, an Italian poem of 2937 short lines. Napoleon I. had in-

tended to have the French text of the *Tesoro* printed with commentaries, and appointed a commission for the purpose. It was at last published in the *Collection des Documents inédits*, Paris, 1863. 4to, 772 pages, edited by Chabaille from 42 MSS.

Bartholomæus de Glanvilla, an English Franciscan friar, wrote about 1360 a most popular work, *De proprietatibus rerum*, in 19 books and 1230 chapters.

Book 1 relates to God; 2, angels; 3, the soul; 4, the substance of the body; 5, anatomy; 6, ages; 7, diseases; 8, the heavens (astronomy and astrology); 9, time; 10, matter and form; 11, air; 12, birds (including insects, 33 names, Aquila to Vespertilio); 13, water (with fishes); 14, the earth (42 mountains, Ararath to Ziph); 15, provinces (171 countries, Asia to Zengia); 16, precious stones (including coral, pearl, salt, 104 names, Arena to Zinguttes); 17, trees and herbs (197, Arbor to Zucarum); 18, animals (114, Aries to Vipera); 19, colours, scents, flavours, and liquors, with a list of 86 eggs, Aspis to Vultur. Some editions add book 20, accidents of things, that is numbers, measures, weights, and sounds. The Paris edition of 1574 has a book on bees.

There were 15 editions before 1500. An English translation was completed 11th February 1398 by John Trevisa, and printed by Wynkyn de Worde, Westminster, 1495? fol.; London, 1533, fol.; and with considerable additions by Stephen Batman, a physician, London, 1582, fol. It was translated into French by Jehan Corbichon at the command of Charles V. of France, and printed 14 times from 1482 to 1556. A Dutch translation was printed in 1479, and again at Harlem, 1485, fol.; and a Spanish translation by Padre Vincinte de Burgos, Tholosa, 1494, fol.

Petrus Berchorius, a French Benedictine, prior of the abbey of St Eloy in Paris, where he died in 1362, wrote a kind of encyclopædia, chiefly relating to divinity, in three parts:—*Reductorium morale super totam Bibliam*, 428 *moralitates* in 34 books on the Bible from Genesis to Apocalypse; *Reductorium morale de proprietatibus rerum*, in 14 books and 958 chapters, a methodical encyclopædia or system of nature on the plan of Bartholomæus de Glanville, and chiefly taken from him (Berchorius places animals next after fishes in books 9 and 10, and adopts as natural classes *volatilia*, *natalitia*, and *gressibilia*); *Dictionarius*, an alphabetical dictionary of 3514 words used in the Bible with moral expositions, occupying in the last edition 1558 folio pages. The first part was printed 11 times from 1474 to 1515, and the third 4 times. The three parts were printed together as *Petri Berchorii operum omnia* (an incorrect title, for he wrote much besides), Moguntia, 1609, fol. 3 vols., 2719 pages; Colonia Agrippina, 1631, fol. 3 vols.; *ib.* 1730-31, fol. 6 vols., 2570 pages.

A very popular small encyclopædia, *Margarita philosophica*, in 12 books, divided into 26 tractates and 573 chapters, was written by George Reisch, a German, prior of the Carthusians of Freiburg, and confessor of the emperor Maximilian I. Books 1-7 treat of the seven liberal arts; 8, 9, principles and origin of natural things; 10, 11, the soul, vegetative, sensitive, and intellectual; 12, moral philosophy. The first edition, Heidelberg, 1496, 4to, was followed by 8 others to 1535. An Italian translation by the astronomer Giovanni Paolo Gallucci was published at Venice in 1594, 1138 small quarto pages, of which 343 consist of additional tracts appended by the translator.

Raphael Maffei, called Volaterranus, being a native of Volterra, where he was born in 1451 and died 5th January 1522, wrote *Commentarii Urbani*, Rome, 1506, fol., in 38 books, so called because written at Rome. This encyclopædia, printed eight times up to 1603, is remarkable for the great importance given to geography, and also to biography, a subject not included in previous encyclopædias. Indeed, the book is formed of three nearly equal parts,—geographia, 11 books; anthropologia (biography), 11 books; and philologia, 15 books. The books are not divided into

short chapters in the ancient manner, like those of its predecessors. The edition of 1603 contains 814 folio pages. The first book consists of the table of contents and a classed index; books 2-12, geography; 13-23, lives of illustrious men, the popes occupying book 22, and the emperors book 23; 24-27, animals and plants; 28, metals, gems, stones, houses, and other inanimate things; 34, de scientiis cyclicis (grammar and rhetoric); 35, de scientiis mathematicis (arithmetic, geometry, optica, catoptrica, astronomy, and astrology); 36-38, Aristotelica (on the works of Aristotle).

George Valla, born about 1430 at Placentia, and therefore called Placentinus, died at Venice in 1499 while lecturing on the immortality of the soul. Aldus published his work, edited by his son John Peter Valla, *De expentendis et fugiendis rebus*, Venetiis, 1501, fol. 2 vols.

It contains 49 books and 2119 chapters. Book 1 is introductory, on knowledge, philosophy, and mathematics, considered generally (he divides everything to be sought or avoided into three kinds—those which are in the mind, in the body by nature or habit, and thirdly, external, coming from without); books 2-4, arithmetic; 5-9, music; 10-15, geometry, including Euclid and mechanics,—book 15 being in three long chapters—de spiritalibus, that is, pneumatics and hydraulics, de catoptrics, and de optice; 16-19, astrology (with the structure and use of the astrolabe); 20-23, physics (including metaphysics); 24-30, medicine; 31-34, grammar; 35-37, dialectics; 38, poetry; 39, 40, rhetoric; 41, moral philosophy; 42-44, economics; 45, politics; 46-48, de corporis commodis et incommodis, on the good and evil of the body (and soul); 49, de rebus externis, as glory, grandeur, &c.

Antonio Zara, born 1574, made bishop of Petina in Istria 1600, finished 17th January 1614 a work published as *Anatomia Ingeniorum et Scientiarum*, Venetiis, 1615, 4to, 664 pages, in four sections and 54 membra. The first section, on the dignity and excellence of man, in 16 membra, considers him in all his bodily and mental aspects. The first membrum describes his structure and his soul, and in the latter part contains the author's preface, the deeds of his ancestors, an account of himself, and the dedication of his book to Ferdinand archduke of Austria. Four membra treat of the discovery of character by chiromancy, physiognomy, dreams, and astrology. The second section treats of 16 sciences of the imagination,—writing, magic, poetry, oratory, courtiership (aulicitas), theoretical and mystic arithmetic, geometry, architecture, optics, cosmography, astrology, practical medicine, war, government. The third section treats of 8 sciences of intellect,—logic, physics, metaphysics, theoretical medicine, ethics, practical jurisprudence, judicature, theoretical theology. The fourth section treats of 12 sciences of memory,—grammar, practical arithmetic, human history, sacred canons, practical theology, sacred history, and lastly the creation and the final catastrophe. The book, now very rare, is well arranged, with a copious index, and is full of curious learning.

Johann Heinrich Alsted, born 1588, died 1638, published *Encyclopædia septem tomis distincta*, Herbomæ Nassovorum 1630, fol. 7 vols., 2543 pages of very small type. It is in 35 books, divided into 7 classes, preceded by 48 synoptical tables of the whole, and followed by an index of 119 pages.

I. *Precognita disciplinarum*, 4 books, hexologia, technologia, archeologia, didactica, that is, on intellectual habits and on the classification, origin, and study of the arts. II. *Philology*, 6 books, lexica, grammar, rhetoric, logic, oratory, and poetry: book 5, lexica, contains dictionaries explained in Latin of 1076 Hebrew, 842 Syriac, 1934 Arabic, 1923 Greek, and 2092 Latin words, and also nomenclator technologiae, &c., a classified vocabulary of terms used in the arts and sciences, in Latin, Greek, and Hebrew, filling 34 pages; book 6 contains Hebrew, Aramaic, Greek, Latin, and German grammars; book 10, poetica, contains a list of 61 Kottwelsch words. III. *Theoretic philosophy*, 10 books.—book 11, metaphysics; 12, pneumatica (on spirits); 13, physics; 14, arithmetic; 15, geometry; 16, cosmography; 17, uranometria (astronomy and astrology); 18, geography (with maps of the Old World, eastern Mediterranean, and Palestine under the Old and New Testaments, and a plate of Noah's

ark); 19, optics; 20, music. IV. Practical philosophy, 4 books:—21, ethics; 22, economics (on relationships); 23, politics, with florilegium politicum, 119 pages of extracts from historians, philosophers, and orators; 24, scholastics (on education, with a florilegium of 25 pages). V. The three superior faculties:—25, theology; 26, jurisprudence; 27, medicine (ending with the rules of the Salernian school). VI. Mechanical arts in general:—book 28, mathematical mechanical arts; book 29, agriculture, gardening, care of animals, baking, brewing, preparing medicines, metallurgy (with mining); book 30, physical mechanical arts—printing, dialling, &c. Under *pædutica* (games) is Vida's Latin poem on chess, and one by Leuschner on the ludus Lortzius. VII. Farragines disciplinarum, 5 books:—31, mnemonics; 32, history; 33, chronology; 34, architecture; 35, quodlibetica, miscellaneous arts, as magic, cabbala, alchemy, magnetism, &c., with others apparently distinguished and named by himself, as, paradoxologia, the art of explaining paradoxes; dipnosophistica, the art of philosophizing while feasting; cyclognomica, the art of conversing well de quovis scibili; tabacologia, the nature, use, and abuse of tobacco, &c.,—in all 35 articles in this book.

Alsted's encyclopædia was received with very great applause, and was highly valued. Lami (*Entretiens*, 1684, p. 188) thought it almost the only encyclopædia which did not deserve to be despised. Alsted's learning was very various, and his reading was very extensive and diversified. He gives few references, and Thomasius charges him with plagiarism, as he often copies literally without any acknowledgment. He wrote not long before the appearance of encyclopædias in modern languages superseded his own and other Latin books, and but a short time before the alphabetical arrangement began to prevail over the methodical. His book was reprinted, Lugduni, 1649, fol. 4 vols., 2608 pages.

Jean de Magnon, historiographer to the king of France, undertook to write an encyclopædia in French heroic verse, which was to fill ten volumes of 20,000 lines each, and to render libraries merely a useless ornament. But he did not live to finish it, as he was killed at night by robbers on the Pont Neuf in Paris, in April 1662. The part he left was printed as *La Science universelle*, Paris, 1663, fol. 348 pages,—10 books containing about 11,000 lines. They begin with the nature of God, and end with the history of the fall of man. His verses, say Chaudon and Delandine, are perhaps the most nerveless, incorrect, obscure, and flat in French poetry; yet the author had been the friend of Molière, and had acted with him in comedy.

Louis Moréri (born 25th March 1643 at Bargemont, in the diocese of Frejus, died 10th July 1680 at Paris) wrote a dictionary of history, genealogy, and biography, *Le grand dictionnaire historique, ou le mélange curieux de l'histoire sacrée et profane*, Lyons, 1674, fol. He began a second edition on a larger scale, published at Lyons in 1681, in two volumes folio; the sixth edition was edited by Jean le Clerc, Amsterdam, 1691, fol. 4 vols.; the twentieth and last edition, Paris, 1759, fol. 10 vols. Moréri's dictionary, still very useful, was of very great value and importance, though not the first of the kind. It superseded the very inferior compilation of Juigné-Broissinère, *Dictionnaire Théologique, Historique, Poétique, Cosmographique, et Chronologique*, Paris, 1644, 4to; Rouen, 1668, &c.,—a translation, with additions, of the *Dictionarium Historicum, Geographicum, et Poeticum* of Charles Estienne, published in 1553, 4to, and often afterwards. As such a work was much wanted, Juigné's book went through twelve editions in less than thirty years, notwithstanding its want of criticism, errors, anachronisms, defects, and inferior style.

Johann Jacob Hofmann, born 11th September 1635, died 10th March 1706; son of a schoolmaster at Basel, which he is said never to have left, and where he was professor of Greek and History, wrote *Lexicon Universale Historico-Geographico-Chronologico-Poetico-Philologicum*,

Basilee, 1677, fol. 2 vols., 1823 pages, a dictionary of history, biography, geography, genealogies of princely families, chronology, mythology, and philology. At the end is *Nomenclator Μιζόγλωττος*, an index of names of places, people, &c., in many languages, carefully collected, and explained in Latin, filling 110 pages; with an index of subjects not forming separate articles, occupying 34 pages. In 1683 he published a continuation in 2 vols. fol., 2293 pages, containing, besides additions to the subjects given in his lexicon, the history of animals, plants, stones, metals, elements, stars, and especially of man and his affairs, arts, honours, laws, magic, music, rites, and a vast number of other subjects. In 1698 he published a second edition, *Lugduni Batavorum*, fol. 4 vols., 3742 pages, incorporating the continuation with additions. From the great extent of his plan, many articles, especially in history, are superficial and faulty.

Étienne Chauvin was born at Nismes 18th April 1640. He fled to Rotterdam on the revocation of the Edict of Nantes, and in 1688 supplied Bayle's place in his lectures on philosophy. In 1695 he was invited by the elector of Brandenburg to go as professor of philosophy to Berlin, where he became the representative of the Cartesian philosophy, and died 6th April 1725. He wrote *Lexicon Rationale, sive Thesaurus Philosophicus Ordine Alphabetico digestus*, Rotterdam, 1692, fol. 746 pages and 30 plates. An improved and enlarged edition was printed as *Lexicon philosophicum secundis curis*, Leovardie, 1713, large folio, 725 pages, and 30 plates. This great work may be considered as a dictionary of the Cartesian philosophy, and was very much used by Brucker and other earlier historians of philosophy. It is written in a very dry and scholastic style, and seldom names authorities.

The great dictionary of French, begun by the French Academy 7th February 1639, excluded all words especially belonging to science and the arts. But the success of the rival dictionary of Furetière, which, as its title page, as well as that of the *Essais* published in 1684, conspicuously announced, professed to give "les termes de toutes les Sciences et des Arts," induced Thomas Corneille, a member of the Academy, to compile *Le Dictionnaire des Arts et des Sciences*, which the Academy published with the first edition of their dictionary, Paris, 1694, folio, as a supplement in two volumes containing 1236 pages. It was reprinted at Amsterdam, 1696, fol. 2 vols., and at Paris in 1720, and again in 1732, revised by Fontenelle. A long series of dictionaries of arts and sciences have followed Corneille in placing in their titles the arts before the sciences, which he probably did merely in order to differ from Furetière. Corneille professed to quote no author whom he had not consulted; to take plants from Dioscorides and Matthioli, medicine from Etmüller, chemistry from a MS. of Perrault, and architecture, painting, and sculpture from Félibien; and to give an abridged history of animals, birds, and fishes, and an account of all religious and military orders and their statutes, heresiarchs and heresies, and dignities and charges ancient and modern.

Pierre Bayle (born 18th November 1647, died 28th December 1706) wrote a very important and valuable work, *Dictionnaire Historique et Critique*, Rotterdam, 1697, fol. 2 vols. His design was to make a dictionary of the errors and omissions of Moréri and others, but he was much embarrassed by the numerous editions and supplements of Moréri. A second edition with an additional volume appeared at Amsterdam in 1702, fol. 3 vols. The fourth edition, Rotterdam, 1720, fol. 4 vols., was much enlarged from his manuscripts, and was edited by Prosper Marchand. It contains 3132 pages besides tables, &c. The ninth edition was published at Basel, 1741, fol. 10 vols. It was translated into English from the second edition, London,

1709, fol. 4 vols., with some slight additions and corrections by the author; and again from the fifth edition of 1730 by Birch and Lockman, London, 1734–40, fol. 5 vols. J. G. de Chauffepié published *Nouveau Dictionnaire historique*, Amsterdam, 1750–56, fol. 4 vols., as a supplement to Bayle. It chiefly consists of the articles added by the English translators with many corrections and additions, and about 500 new articles added by himself, and contains in all about 1400 articles. Prosper Marchand, editor of the fourth edition, left at his death, 14th January 1756, materials for a supplementary *Dictionnaire historique*, La Haye, 1758, fol. 2 vols. 891 pages, 136 articles. It had occupied his leisure moments for forty years. Much of his work was written on small scraps of paper, sometimes 20 in half a page and no larger than a nail, in such small characters that not only the editor but the printer had to use powerful magnifiers. Bayle's dictionary was also translated into German, Leipzig, 1741–44, fol. 4 vols., with a preface by J. C. Gottsched. It is still a work of great importance and value.

Vincenzo Maria Coronelli, a Franciscan friar, who was born in Venice about 1650, made cosmographer to the republic in 1685, became general of his order in 1702, and was found dead at his study table 9th December 1718, began in 1701 to publish a general alphabetical encyclopædia, written in Italian, at which he had been working for thirty years, *Biblioteca Universale Sacro-profana*. It was to explain more than 300,000 words, to include history and biography as well as all other subjects, and to extend to 45 volumes folio. Volumes 1–39 were to contain the dictionary A to Z; 40, 41, the supplement; 42, retractations and corrections; 43, universal index; 44, index divided into matters; 45, index in various languages. But seven volumes only were published, Venezia, 1701–6, fol. 5609 pages, A to Caque. The first six volumes have each an index of from 28 to 48 pages (in all 224 pages) of subjects, whether forming articles or incidental. The articles in each are numbered, and amount to 30,269 in the six volumes, which complete the letter B. On an average 3 pages contain 22 articles. Each volume is dedicated to a different patron,—the pope, the doge, the king of Spain, &c. This work is remarkable for the extent and completeness of its plan, and for being the first great alphabetical encyclopædia, as well as for being written in a modern language, but it was hastily written and very incorrect. Never, perhaps, says Tiraboschi (*Storia della Letteratura Italiana*, viii. 546), was there so quick a writer; he composed a folio volume as easily as others would a page, but he never perfected his works, and what we have of this book will not induce us to regret the want of the remainder.

The first alphabetical encyclopædia written in English was the work of a London clergyman, John Harris (born about 1667, elected first secretary of the Royal Society 30th November 1709, died 7th September 1719), *Lexicon Technicum, or an universal English Dictionary of Arts and Sciences*, London, 1704, fol. 1220 pages, 4 plates, with many diagrams and figures printed in the text. Like many subsequent English encyclopædias the pages are not numbered. It professes not merely to explain the terms used in the arts and sciences, but the arts and sciences themselves. The author complains that he found much less help from previous dictionaries than one would suppose, that Chauvin is full of obsolete school terms, and Corneille gives only bare explanations of terms, which often relate only to simple ideas and common things. He omits theology, antiquity, biography, and poetry; gives only technical history, geography, and chronology; and in logic, metaphysics, ethics, grammar, and rhetoric, merely explains the terms used. In mathematics and anatomy he professes

to be very full, but says that the catalogues and places of the stars are very imperfect, as Flamsteed refused to assist him. In botany he gave from Ray, Morrison, and Tournefort "a pretty exact botanick lexicon, which was what we really wanted before," with an account of all the "kinds and subalternate species of plants, and their specific differences" on Ray's method. He gave a table of fossils from Dr Woodward, professor of medicine in Gresham College, and took great pains to describe the parts of a ship accurately and particularly, going often on board himself for the purpose. In law he abridged from the best writers what he thought necessary. He meant to have given at the end an alphabet for each art and science, and some more plates of anatomy and ships, "but the undertaker could not afford it at the price." A review of his work, extending to the unusual length of four pages, appeared in the *Philosophical Transactions*, 1704 (p. 1699). This volume was reprinted in 1708. A second volume of 1419 pages and 4 plates appeared in 1710, with a list of about 1300 subscribers. Great part of it consisted of mathematical and astronomical tables, as he intended his work to serve as a small mathematical library. He was allowed by Sir Isaac Newton to print his treatise on acids. He gives a table of logarithms to seven figures of decimals (44 pages), and one of sines, tangents, and secants (120 pages), a list of books filling two pages, and an index of the articles in both volumes under 26 heads, filling 50 pages. The longest lists are law (1700 articles), chyrurgery, anatomy, geometry, fortification, botany, and music. The mathematical and physical part is considered very able. He often mentions his authorities, and gives lists of books on particular subjects, as botany and chronology. His dictionary was long very popular. The fifth edition was published in 1736, fol. 2 vols. A supplement, including no new subjects, appeared in 1744, London, fol. 996 pages, 6 plates. It was intended to rival Chambers, but, being considered a bookseller's speculation, was not well received.

Johann Hübner, rector of the Johanneum in Hamburg, born 17th March 1668, wrote prefaces to two dictionaries written in German, which bore his name, and were long popular. The first was *Reales Staats-Zeitungs- und Conversations-Lexicon*, Leipzig, 1704, 8vo; second edition, 1706, 947 pages; at the end a register of arms, and indexes of Latin and French words; fifth edition, 1711; fifteenth edition 1735, 1119 pages. The thirty-first edition was edited and enlarged by F. A. Rüder, and published by Brockhaus, Leipzig, 1824–28, 8vo, 4 vols., 3088 pages. It was translated into Hungarian by Fejer, Pesten, 1816, 8vo, 5 vols., 2958 pages. The second published as a supplement, was *Curieuses und reales Natur-Kunst-Berg-Gewerb- und Handlungs-Lexicon*, Leipzig, 1712, 8vo, 788 pages, frequently reprinted to 1792. The first relates to the political state of the world, as religion, orders, states, rivers, towns, castles, mountains, genealogy, war, ships; the second to nature, science, art, and commerce. They were the work of many authors, of whom Paul Jacob Marpurger, a celebrated and voluminous writer on trade and commerce, born at Nuremberg 27th June 1656, was an extensive contributor, and is the only one named by Hübner.

Johann Theodor Jablonski, who was born at Dantzic 15th December 1654, appointed secretary to the newly founded Prussian Academy in 1700, when he went to Berlin, where he died 28th April 1731, published *Allgemeines Lexicon der Künste und Wissenschaften*, Leipzig, 1721, 4to, a short but excellent encyclopædia still valued in Germany. It does not include theology, history, geography, biography, and genealogy. He not only names his authorities, but gives a list of their works. A new edition in 1748 was increased one-third to 1508 pages. An improved edition, Königsberg and Leipzig, 1767, 4to, 2 vols., 1852 pages,