

(4) *Chloride of Silver* (AgCl) comes down as a precipitate when solutions of silver salts are mixed with solutions of chlorides (for preparative purposes AgNO₃ with HCl, which is preferable to NaCl). The mixture at first has the appearance of a milk, but on being violently shaken it divides into a curdy, heavy, easily settling precipitate and a clear solution,—more readily if the co-reagents are exactly balanced or the silver is in excess than when the precipitant predominates. Chloride of silver is as good as insoluble in water, but hydrochloric acid, and chloride solutions generally, dissolve it perceptibly. In dilute sulphuric and nitric acids it is as insoluble as in plain water. Even boiling oil of vitriol attacks it only very slowly. It is readily soluble in ammonia solution and reprecipitated therefrom on acidification. It dissolves in aqueous thiosulphate of soda, Na₂S₂O₃, forming the very stable salt NaAg₂S₂O₃, and in cyanide of potassium solution, forming KAg(CN)₂. From either solution the silver is conveniently recoverable only by sulphuretted hydrogen or sulphide of ammonium as an Ag₂S precipitate. Chloride of silver fuses at 260° C. into a yellowish liquid, freezing into a transparent, almost colourless, glass of horn-like consistence (hence the name "horn-silver"). The specific gravity of frozen AgCl is 5.45 (Karsten). It remains undecomposed, but volatilizes appreciably at a red heat. Hydrogen at a dull red heat reduces it to metal. A similar reduction is effected in even the compact chloride by contact with zinc, water, and a little dilute sulphuric acid; the reduction, however, proceeds rather slowly and is rarely quite complete. *Unfused* chloride of silver, when exposed to sunlight, becomes at first violet, then darker and darker, and at last black, through progressive dechlorination. Yet even the black final product, according to Bibra, yields up no silver to hot nitric acid.

(5) *Bromide of Silver* (AgBr) closely resembles the chloride. The reduction on insolation is prevented by the presence of a trace of free bromine and promoted by that of nitrate of silver. Chlorine converts the hot fused salt into chloride.

(6) *Iodide of Silver* (AgI), while similar on the whole to the other two haloids, presents marked peculiarities. As formed by precipitation it is distinctly yellow; it is insoluble in, but decolorized by, ammonia; it is less soluble in water and dilute nitric acid or other nitrate solutions than even the bromide, this latter exceeding in this sense the chloride. But boiling oil of vitriol decomposes it slowly, with elimination of iodine vapours and formation of sulphate. Hydrogen at a red heat does not act upon it; nor is it at all easily decomposed by zinc and dilute acid. Precipitated iodide of silver is characteristically soluble in solutions of alkaline iodides and in those of nitrate of silver, with formation of double salts, which, however, are all decomposed, more or less completely, by addition of much water. *Pure* iodide of silver, even if recently precipitated, is not changed by sunlight, but if contaminated with nitrate of silver it readily blackens. For action of light on silver haloids, see PHOTOGRAPHY.

ANALYSIS.—In a solution of salts derived from purely oxygenated acids the least trace of silver can be detected by hydrochloric acid, which precipitates the silver as chloride (see above). The precipitate, when produced in a possibly complex solution, may include the chlorides of lead (PbCl) and mercurousum (Hg₂Cl₂). Repeated treatment of the (washed) precipitate with boiling water extracts the lead chloride; then by pouring ammonia on the precipitate we convert the Hg₂Cl₂ into an insoluble black body, while the chloride of silver dissolves and, from the filtrate, can be precipitated by acidification. For the *quantitative* determination of silver, the ordinary laboratory method is to bring the metal into solution as nitrate and then to throw it down as pure chloride. The chloride is washed, collected, dehydrated by fusion, and weighed. According to Stas, if O=16, Ag=107.93 and Cl=35.454; hence the chloride contains 0.75273 of its weight of metal.

The *assaying* of silver ores is done preferably in the "dry way"; in fact relatively poor ores cannot be assayed satisfactorily in any other. The general method with sulphureous ores is to mix them, as powders, with (silver-free) oxide of lead and tartar, and fuse in a clay or graphite crucible. The regulus includes all the silver. The fuse is poured into a conical mould of cast-iron, when the metal goes to the bottom of the mould; the ingot, after cooling, is easily separated from the adhering slag. The slag-free regulus is then placed in a little cupel made out of compressed bone-ash, and is heated in a muffle to redness and kept at this temperature in the current of air which pervades the muffle in virtue of its disposition in the furnace until all the lead and base metals generally have been sucked up by the porous cupel. The remaining "button" of metal is weighed, which gives the conjoint weight of the silver and gold, which latter metal is rarely absent. For its determination the button is rolled out into a piece of thin sheet, which is "parted" with nitric acid (see GOLD). The gold remains and goes to the balance; the weight of the silver is found by difference. Similarly, to determine the fineness of silver alloys, a known weight of the alloy—customarily 0.5 gramme—is "cupelled," with addition of a proportion of pure lead depending on the weight of base metal to be removed, as shown by

the following table, which, however, holds strictly only for copper-silver alloys:—

Fineness 1000-900.....	80 units of lead per unit of copper.
" 900-850.....	64 "
" 800-750.....	53 "
" below 750.....	50-40 "

In a well-appointed laboratory two operators who work into each other's hands can easily make several dozen of such assays in a day. Cupelling, indeed, is the promptest of all methods of analysis, only the results are not quite as exact as is desirable in the case of precious metal, part of the silver being lost by volatilization, and part by being sucked into the cupel. The error attains its maximum in the case of alloys of about 700 per mille, and with these comes to about $\frac{1}{10}$ th of the weight of the silver to be determined. It of course can be, and always is being, corrected to some extent by "blank" assays made with known weights of pure silver and pure copper; but such corrections are not quite safe. Hence cupellation nowadays, in the mints at least, is used only for a first approximation, and the exact fineness determined by the "wet-way" process, invented by Gay-Lussac. See ASSAYING, vol. ii. p. 727.

A most excellent method for the quick determination of a not approximately known weight of dissolved silver has been invented by Volhard. This method rests on the fact that solutions of sulphocyanates (including that intensely red salt Fe(NCS)₂, which is produced when, for instance, NCS.H is mixed with ferric sulphate) precipitate silver completely from even strongly acid solutions, as NCS.Ag. A convenient reagent for this method is produced by dissolving $\frac{1}{3}$ NCS.NH₃ grammes of (chlorine-free) sulphocyanate of ammonium in water to 1000 c.c. to produce a solution of which 1 c.c. precipitates about $\frac{1}{10}$ Ag=10.8 milligrammes of silver. To determine the exact "titre," we dissolve, say, 540 milligrammes of pure silver in 1.2 nitric acid, and next boil away every trace of N₂O₃. We then dilute to say 50 c.c., add 5 c.c. of saturated solution of iron alum (not less), and, lastly, run in sulphocyanate from the burette, until the red colour of ferric sulphocyanate which appears locally from the first, by addition of the last drop of NCS solution, has become permanent on stirring. Supposing 49.3 c.c. of solution to have been required to reach this point, every 1 c.c. of reagent precipitates $\frac{1}{10}$ milligrammes of silver, and it, of course, always does so, even, let us add, in the presence of (say) 70 per cent. of copper beside 30 of silver in the alloy under operation. Volhard's method is more exact, and, with a small number of samples, takes even less time, than cupellation. (W. D.)

Mode of Occurrence.—Silver is rarely found in the native state, and then only in comparatively small quantities. Most of the ores of silver are difficult to reduce, and it is therefore deemed safe to regard this as the last of the three great coining metals which came into use. Silver is originally as widespread as gold, occurring in nearly all the volcanic rocks and some of the Primary ones. In the Silver Reef district of Utah it is found in sedimentary sandstone, though this appears to have undergone some change from volcanic action. But gold remains unaltered by the action of the elements, and is often carried away long distances from its original place of occurrence by the breaking down of the rocks which contain it and their formation anew elsewhere, either as other rocks or as "placers" of gravel or sand, containing gold easily washed out by hand or with rude appliances. Silver, on the contrary, is only to be found in the rocks where it originally occurs. When these are broken down or worn away, the silver is either driven into new mineral combinations, or, more commonly, dissipated and lost. Hence silver is only to be obtained by subterranean mining, and demands the aid of capital and associated labour. The greater rapidity with which gold can be obtained has often influenced the legal relation of value between these two metals, and its bearing upon prices, commerce, and civilization.

Cost of Production.—In nearly all silver ores there is some gold, and in nearly all gold ores some silver. In the £70,000,000 worth of metal produced from the Comstock lode of Nevada nearly one-half in value consisted of gold. For this and other reasons, it is impossible to determine the general average cost of producing gold and silver from all the mines during any reasonably long period of time. If recent statistics are to be trusted, both metals are pro-

duced on the average at a loss. Such is alleged to have been the case in California, Australia, and Nevada,¹ countries whose combined product has equalled in value nearly £600,000,000.

Value.—In some ancient states the value of silver appears to have been superior to that of gold.² Agatharchides informs us that such was the case in ancient Arabia; and Tacitus says the same of ancient Germany. Strabo alleges that the ratio of value in a country bordering that of the Sabæans was at one time one gold to two silver; and so late as the 17th century silver and gold were valued equally in Japan.³ Going back to a remote antiquity, silver appears to have been everywhere equal in value to gold until the silver mines showed signs of exhaustion, when, as the principal coins were of copper and silver, and prices were commonly expressed in these coins, the threatened decrease of money was probably averted and a profit secured for the state by raising the legal value of gold coins. In Greece, in the time of Herodotus (*cf.* iii. 95), gold was 13 times the value of silver, at which ratio it appears to have stood for a long period.

When the Romans acquired the placer mines of Pannonia, Dacia, Spain, Gaul, &c., they made their principal coins of gold; and at a later period, when the supplies of this metal fell off, they raised the legal value of silver coins to one-tenth that of gold ones of like weight and fineness. This ratio was afterwards changed to 11, and still later to 12 silver for 1 gold. In the Arabian states of the 7th century the ratio was about 6½ for 1; yet in France at the same time it was 10 for 1; in England during the 12th century it was 9 for 1; in France during the 14th century certain silver and gold coins of like weight bore the same value, hence the ratio was 1 for 1; in Castile and Leon in 1454-74 it was 7½ for 1. Speaking broadly, between the rise of Mohammedanism and the opening of the silver mines of America the value of silver compared with gold gradually rose. It is evident that there were two lines of ratios, the one having an Indo-Arabic, the other a Romano-Germanic origin, and that the conflict of ratios—which only ceased when America was discovered and a great coinage of the precious metals occurred in Spain—gave rise to many of those otherwise inexplicable lowerings of coins, of one or the other metal, which characterize this period.

In Spain, by the edict of Medina (1497), the ratio was 10½. When America was plundered the first fruits were gold, not silver; whereupon Spain, in 1546, and before the wealth of the silver mines of Potosi was known, raised the legal value of gold to 13½, and, as Spain then monopolized the supplies of the precious metals, the rest of the world was obliged to acquiesce in her valuation. During the following century Portugal obtained such immense quantities of gold from the East Indies, Japan, and Brazil that the value of her imports of this metal exceeded £3,000,000 a year, whilst those of Spain had dwindled to £500,000 in gold, and had only increased to £2,500,000 in silver. Portugal now governed the ratio, and in 1688 raised the value of gold to 16 times that of silver. Except during a brief period of forty years, this ratio has ever since been maintained in Spanish and British America and the United States. A century later the spoils of the Orient were exhausted, the Brazilian placers began to decline, and Portugal lost her importance. Spain thus again got control of the ratio, and, as her colonial produce was chiefly silver, she raised its value in 1775 from one-sixteenth to one-fifteenth and a half

that of gold for the Peninsula, permitting it to remain at one-sixteenth in the colonies. France, whose previous ratio (that of 1726) was 14½, adopted the Spanish ratio of 15½ in 1785, and has adhered to it ever since. These three historical ratios, and the bearing of each upon the others, have influenced all legislation on the subject, and, where there was no legislation, have governed the bullion markets for more than two centuries.

Meanwhile an economical school arose which, while conceding it to be necessary that the state should fabricate coins, denied it the right to limit the number of coins, or to exact payment (seigniorage) for coinage. This school found expression in the Act 18 Charles II. (1666), which permitted private persons to have coined for them an unlimited quantity of gold or silver, at the public mint, free of charge. Similar Acts were passed in Holland, France, and other countries. But the crown retained the right to regulate the nominal value of gold and silver coins, the exercise of which has had the greatest influence on the relative market value of those metals.

To check abuses of this prerogative the economical school next directed its efforts towards the adoption of one in place of two metals for full legal tender coins. The principal advocates of this change during the last century were Dutot (1739) and Desrotours (1790), and during the present one Lord Liverpool (1808), De Quincey (1849), and Chevalier (1856). The policy thus advocated was practically adopted in Holland and England during the 18th century, and by the latter definitively in 1816. It was accepted by the Monetary Conference assembled at Paris June 20, 1867, and by the Commercial Convention at Berlin October 20, 1868. In 1871 it was practically, though not definitively, adopted by Germany, and since that date by several smaller states, including distant Japan. In France (1874) and the United States (1873-78) the policy pursued has been a waiting one. Full legal tender silver coins continue to be employed for money, but the state has ceased to coin silver on private account. Either Germany, France, or the United States may, by simple enactment, and without recoinage or change of coins, return to the "bimetallic" basis of money.

The closure of the mints of all important commercial countries to silver, while they have remained open to the free coinage of gold at a fixed valuation, has enhanced the purchasing power of gold, compared with either silver or other commodities, about one-fourth. The price of uncoined silver being usually quoted in gold, this phenomenon appears as a "fall of silver," by which term it is commonly known. This alleged fall, its causes, consequences, and remedies, constitute the "Silver Question."

Production.—In the principal producing countries—the United States, Mexico, Chili, and Peru—mining is free, and there are no official returns of the production, which is therefore mere matter of conjecture. In the United States it is the custom to value silver bullion at one-sixteenth that of gold. This unduly swells the value of the conjectural product of that country more than one-fourth (see *Report of the United States Monetary Commission of 1876*, Appendix, pp. 1-66). From a careful consideration of the bullion movement, the total annual production of silver throughout the world at the present time is estimated at between 50 and 60 million ounces, at which figure it has remained steady upwards of ten years.

Consumption in the Arts.—Direct inquiries as to the quantity of silver used in the arts have met with little success, and the statistics so obtained are defective. But the total production of silver in the Western World, from the discovery of America to the present time, has been, in value, about 1400 million pounds sterling, of which about 300 million pounds remain in coins. *Conse-*

¹ DelMar, *Hist. Prec. Metals*, chap. xxx.

² Boeckh, *Political Economy of the Athenians*, book i. chap. 6.

³ Sir Edward J. Reed, *Japan*, chap. xviii.; DelMar, *Money and Inflation*, chap. xx.

quently 1100 millions, or nearly four-fifths, have been consumed in the arts, lost, &c., or exported to Asia. There are estimated to be about 50 or 60 million pounds sterling worth of silver coins in India,¹ and some trifling amounts each in China, Japan, Persia, &c. On the whole it appears quite safe to estimate the average annual consumption of silver in the arts and through wear, tear, and loss as fully equal to three-fourths of the production. Lowe in 1822 estimated it at two-thirds. Silver is principally used for plate and jewellery; it is also consumed in photography, and in numerous chemical preparations, such as lunar caustic, indelible ink, hair dyes, fulminating powder, &c.

(A. DE.)

SILVERIUS, the successor of Pope Agapetus I., was a legitimate son of Pope Hormisdas, born before his father entered the priesthood. He was consecrated on June 8, 536, having purchased his elevation to the see of St Peter from the Gothic king Theodotus. Six months afterwards (Dec. 9) he was one of those who admitted Belisarius into the city. He opposed the restoration of the patriarch Anthimus, whom Agapetus had deposed, and thus brought upon himself the hatred of Theodora, who desired to see Vigilius made pope. He was deposed accordingly by Belisarius in March 537 on a charge (not improbably well founded) of treasonable correspondence with the Goths, and degraded to the rank of a simple monk. He found his way to Constantinople, and Justinian, who entertained his complaint, sent him back to Rome, but Vigilius was ultimately able to banish his rival to Pandataria, where the rest of his life was spent in obscurity. The date of his death is unknown.

SILVESTER I., bishop of Rome from January 314 to December 335, succeeded Melchisedes and was followed by Marcus. The accounts of his papacy preserved in the *Liber Pontificalis* (7th or 8th century) and in Anastasius are little else than a record of the gifts said to have been conferred on the Roman Church by Constantine the Great. He was represented at the council of Nice, and is said to have held a council at Rome to condemn the heresies of Arius and others. The story of his having baptized Constantine is pure fiction, as almost contemporary evidence shows the emperor to have received this rite near Nicomedia at the hands of Eusebius, bishop of that city. According to Döllinger, the entire legend, with all its details of the leprosy and the proposed bath of blood, cannot have been composed later than the close of the 5th century, while it is certainly alluded to by Gregory of Tours (*ob.* 594) and Bede. The so-called *Donation of Constantine* was long ago shown to be spurious, but the document is of very considerable antiquity and, in Döllinger's opinion, was forged in Rome between 752 and 777. It was certainly known to Pope Hadrian in 778, and was inserted in the false decretals towards the middle of the next century.

SILVESTER II., pope from 999 till 1003, and previously famous, under his Christian name of Gerbert, first as a teacher and afterwards as archbishop successively of Rheims and Ravenna, was an Aquitanian by birth, and was educated from his boyhood at the abbey of St Gerold in Aurillac. Here he seems to have had Gerald for his abbot and Raymond for his instructor, both of whom were among the most trusted correspondents of his later life. From Aurillac, while yet a young man (*adolescens*), he was carried off to the Spanish march by "Borrell, duke of Hither Spain" for the sake of prosecuting his studies in a district where learning, at that time, flourished more luxuriantly than in Aquitania. Borrell entrusted his young protégé to the care of a certain Bishop Hatto, under whose instruction Gerbert made great progress in mathematics. In

¹ R. B. Chapman, *Financial Department of Government of India.*

this duke we may certainly recognize Borel, who, according to the Spanish chroniclers, was count of Barcelona from 967 to 993, while the bishop may probably be identified with Hatto, bishop of Vich or Ausona from c. 960 to 971 or 972. In company with his two patrons Gerbert visited Rome, where the pope, hearing of the young student's proficiency in music and astronomy, induced him to remain in Italy, and before long introduced him to the emperor Otto I. A papal diploma, still extant, shows that Count Borel and Bishop Octo or Otho of Ausona were at Rome in January 971, and, as all the other indications point to a corresponding year, enables us to fix the chronology of Gerbert's later life.

When brought before the emperor, Gerbert admitted his skill in all branches of the quadrivium, but lamented his comparative ignorance of logic. Eager to supply this deficiency he seized the opportunity of following Lothaire's ambassador Garamnus, archdeacon of Rheims, to this city, for the sake of studying under so famous a dialectician in the episcopal schools which were then (c. 972?) rising into reputation under the care of Archbishop Adalbero (969-989). So promising a scholar soon attracted the attention of Adalbero himself, and Gerbert was speedily invited to exchange his position of learner for that of teacher. At Rheims he seems to have studied and lectured for many years, having amongst his pupils, now or at a later time, Hugh Capet's son Robert, afterwards king of France, and Richer, to whose history we owe almost every detail of his master's early life. According to this writer Gerbert's fame began to spread over western Europe, throughout Gaul, Germany, and Italy, till it roused the envy of a rival teacher, Otric of Saxony, in whom we may doubtless recognize Oetricus of Magdeburg, the favourite scholar of Otto I., and, in earlier days, the instructor of St Adalbert, the apostle of the Bohemians. Otric, suspecting that Gerbert erred in his classification of the sciences, sent one of his own pupils to Rheims to take notes of his lectures, and, finding his suspicions correct, accused him of his error before Otto II. The emperor, to whom Gerbert was well known, appointed a time for the two philosophers to argue before him; and Richer has left a long account of this dialectical tournament at Ravenna, which lasted out a whole day and was only terminated towards evening at the imperial bidding. The date of this controversy seems to have been about Christmas 980, and it was probably followed almost immediately by Otric's death, October 1, 981.

It must have been about this time (c. 982) that Gerbert received the great abbey of Bobbio from the emperor. That it was Otto II., and not, as formerly supposed, Otto I., who gave him this benefice, seems evident from a diploma quoted by Mabillon (*Annales*, iv. 121). Richer, however, makes no mention of this event; and it is only from allusions in Gerbert's letters that we learn how the new abbot's attempts to enforce his dues waked a spirit of discontent which at last drove him in November 983 to take refuge with his old patron Adalbero. It was to no purpose that he appealed to the emperor and empress for restitution or redress; and it was perhaps the hope of extorting his reappointment to Bobbio, as a reward for his services to the imperial cause, that changed the studious scholar of Rheims into the wily secretary of Adalbero. It was a time of great moment in the history of Western Europe. Otto II. died in December 983, leaving the empire to his infant heir Otto III. Lothaire claimed the guardianship, and attempted to make use of his position to serve his own purposes in Lorraine, which would in all probability have been lost to the empire had it not been for the indefatigable efforts of Adalbero and Gerbert. Into the obscure details of the succeeding years,

as they have to be pieced together from the letters of Gerbert and the hints of Richer or the later annalists, there is no need to enter here. Gerbert's policy is to be identified with that of his metropolitan, and was strongly influenced by gratitude for the benefits that he had received from both the elder Ottos.

According to M. Olleris's arrangement of the letters, Gerbert was at Mantua and Rome in 985. Then followed the death of Lothaire (2d March 986) and of Louis V., the last Carolingian king, in May 987. Later on in the same year Adalbero crowned Hugh Capet (1st June) and his son Robert (25th December). Such was the power of Adalbero and Gerbert in those days that it was said their influence alone sufficed to make and unmake kings. The archbishop died 23d January 989, having, according to his secretary's account, designated Gerbert his successor before his decease. Notwithstanding this, the influence of the empress Theophania secured the appointment for Arnulf, a bastard son of Lothaire. The new prelate took the oath of fealty to Hugh Capet and persuaded Gerbert to remain with him. When Charles of Lorraine, Arnulf's uncle, and the illegitimate son of Louis D'Outremer, surprised Rheims in the autumn of the same year, Gerbert fell into his hands and for a time continued to serve Arnulf, who had now gone over to his uncle's side. He had, however, returned to his allegiance to the house of Capet before the fall of Laon placed both Arnulf and Charles at the mercy of the French king (c. 30th March 991). Then followed the council of St Basle, near Rheims, at which Arnulf confessed his treason and was degraded from his office (17th June 991). In return for his services Gerbert was elected to succeed the deposed bishop.

The episcopate of the new metropolitan was marked by a vigour and activity that were felt not merely in his own diocese but as far as Tours, Orleans, and Paris. Meanwhile the friends of Arnulf appealed to Rome, and a papal legate was sent to investigate the question. As yet Hugh Capet maintained the cause of his nominee and forbade the prelates of his kingdom to be present at the council of Mouzon, near Sedan (June 2, 995). Notwithstanding this prohibition Gerbert appeared in his own behalf. The events of the next few years are somewhat obscure. Council seems to have followed council, but with uncertain results. At last Hugh Capet died in 996, and, shortly after, his son Robert married Bertha, the widow of Odo, count of Blois. The pope condemned this marriage as adulterous; and Abbo of Fleury, who visited Rome shortly after Gregory V.'s accession, is said to have procured the restoration of Arnulf at the new pontiff's demand. We may surmise that Gerbert left France towards the end of 995, as he was present at Otto III.'s coronation, May 21, 996. Somewhat later he became Otto's instructor in arithmetic, and had been appointed archbishop of Ravenna before May 998. Early in the next year he was elected pope (April 999), and took the title of Silvester II. In this capacity Gerbert showed the same energy that had characterized his former life. He is generally credited with having fostered the splendid vision of a restored empire that now began to fill the imagination of the young emperor, who is said to have confirmed the papal claims to eight counties in the Ancona march. Writing in the name of the desolate church at Jerusalem he called upon the warriors of Christendom to arm themselves in defence of the Holy City, once "the light of the world," but now fallen so low. Thus he sounds the first trumpet-call of the crusades, though almost a century was to pass away before his note was repeated by Peter the Hermit and Urban II.¹

¹ This letter, even if spurious as now suspected, is found in the 11th-century Leyden MS., and is therefore anterior to the first crusade.

Nor did Silvester II. confine himself to plans on a large scale. He is also found confirming his old rival Arnulf in the see of Rheims; summoning Adalbero or Azelmo of Laon to Rome to answer for his crimes; judging between the archbishop of Mainz and the bishop of Hildesheim; besieging the revolted town of Cesena; flinging the count of Angoulême into prison for an offence against a bishop; confirming the privileges of Fulda abbey; granting charters to bishoprics far away on the Spanish mark; and, on the eastern borders of the empire, erecting Prague as the seat of an archbishopric for the Slavs. More remarkable than all his other acts is his letter to St Stephen, king of Hungary, to whom he sent a golden crown, and whose kingdom he accepted as a fief of the Holy See. It must, however, be remarked that the genuineness of this letter, in which Gerbert to some extent foreshadows the temporal claims of Hildebrand and Innocent III., has been hotly contested, and that the original document has long been lost. All Gerbert's dreams for the advancement of church and empire were cut short by the death of Otto III., 4th February 1002; and this event was followed a year later by the death of the pope himself, which took place 12th May 1003. His body was buried in the church of St John Lateran, where his tomb and inscription are yet to be seen.

A few words must be devoted to Silvester II. as regards his attitude to the Church of Rome and the learning of his age. He has left us two detailed accounts of the proceedings of the council of St Basle; and, despite his reticence, it is impossible to doubt that he was the moving spirit in Arnulf's deposition. On the whole it may be said that his position in this question as to the rights of the papal see over foreign metropolitans resembled that of his great predecessor Hincmar, to whose authority he constantly appeals. But it is useless to seek in his writings for any definition of the relationship of these powers laid down with logical precision. He is rather the practised debater who will admit his opponent's principles for the moment when he sees his way to moulding them to his own purposes, than the philosophical statesman, who has formulated a theory from whose terms he will not move. Roughly sketched, his argument is as follows. Rome is indeed to be honoured as the mother of the churches; nor would Gerbert oppose her judgments except in two cases—(1) where she enjoins something that is contrary to the decrees of a universal council, such as that of Nice, or (2) where, after having been once appealed to in a matter of ecclesiastical discipline and having refused to give a plain and speedy decision, she should, at a later date, attempt to call in question the provisions of the metropolitan synod called to remedy the effects of her negligence. The decisions of a Gregory or a Leo the Great, of a Gelasius or an Innocent, prelates of holy life and unequalled wisdom, are accepted by the universal church; for, coming from such men, they cannot but be good. But who could recognize in the cruel and lustful popes of later days, in John XII. or Boniface VII., "monsters, as they were, of more than human iniquity,"—anything else than "Antichrist sitting in the temple of God and showing himself as God?" Gerbert proceeds to argue that the church councils admitted the right of metropolitan synods to depose unworthy bishops, but contends that, even if an appeal to Rome were necessary, that appeal had been made a year before without effect. This last clause prepares us to find him shifting his position still further at the council of Causey, where he advances the proposition that John XVI. was represented at St Basle by his legate Seguin, archbishop of Sens, and that, owing to this, the decrees of the latter council had received the papal sanction. Far firmer is the tone of his later letter to the same archbishop, where he contends from historical evidence that the papal judgment is not infallible, and encourages his brother prelate not to fear excommunication in a righteous cause, for it is not in the power even of the successor of Peter "to separate an innocent priest from the love of Christ."

Besides being the most distinguished statesman Gerbert was also the most accomplished scholar of his age. But in this aspect he is rather to be regarded as the diligent expositor of other men's views than as an original thinker. Except as regards philosophical and religious speculation, his writings show a range of interest and knowledge quite unparalleled in that generation. His pupil Richer has left us a detailed account of his system of teaching at Rheims. So far as the trivium is concerned, his text-books were Victorinus's translation of Porphyry's *Isagoge*, Aristotle's *Categories*, and Cicero's *Topics* with Manlius's *Commentaries*. From dialectics he urged his pupils to the study of rhetoric; but, recognizing the necessity of a large vocabulary, he accustomed them to read the Latin poets with care. Virgil, Statius, Terence, Juvenal, Horace,