

CHAPTER XIX.

Mines.

Since the cessation of intercourse with the American colonies, some attention has been paid by the Spanish government to the vast mineral riches of the country which had fallen into a state of entire neglect. A system has been adopted, which, if persevered in, bids fair to render them of more real value than those of Peru or Mexico. The system of monopoly has been almost entirely abolished, and the mines have been placed under a just and moderate code of laws. The soil is free to every one to search for minerals; on the discovery, or denunciation as it is termed, a grant is made of the district gratis by the crown, under certain regulations as to space and time of working. The conditions of expenditure not being complied with in a certain period, the exclusive right ceases. The damages done to the surface are made good to the proprietor of the soil. A small duty on the produce, and an additional one if exported, are paid to the government, and there ought to be no other. However in the manner every thing tends to abuse, there is a heavy duty on each furnace of the noble establishment for smelting lead at Adra, which is levied on the whole number, without

regard to their being in work or not. Another inconvenience results from the mode of levying these duties. There are in all the districts, a set of retainers of the king, who must be paid, and flattered and kept in good humour, to the annoyance of those of whose time a portion is occupied by these spies, whom they would willingly eject from the place. These laws have been a few years only in operation, but they have already produced considerable benefit, and companies are forming in all parts. An evil is connected with these enterprises, the ancient prejudices respecting the enormous profits occasionally derived from them, induces, many persons to embark, under the idea of rapidly making fortunes, and their hopes not being suddenly realized, they are discouraged, and cease to use the exertion necessary to ensure moderate success. The mines of all kinds that I visited, are now almost entirely worked by natives, who have as great aptitude for that or any other labour, as any people in the world. Some of the processes of manufacturing iron, and others which require scientific skill, are still in the hands of strangers of all nations, who have been collected for the purpose; but they are rapidly advancing, and in a few years will want only machinery, which cannot yet be made in the country.

I am unacquainted with any mine of gold in Spain, those of ancient times being lost. Near Almazarron is a range mentioned in the geological abstract, which I have little doubt contained the lost mines of Cartagena, from which it is not far distant. The gold washings of the Darro at Granada are now open to the public and give subsistence to a few people, but the produce is too scanty to deserve much notice. The silver

mine of Guadalcanal, in the Sierra Morena, one of the richest in the world, previous to the discovery of America, after long neglect, has been again opened. The ancient works were resumed, but given up as impracticable from the quantity of water, and they have tried another vein at a short distance, but at a vast expense, and hitherto without success. I have specimens of the ore which has been obtained in small quantities, and yields seventy per cent of silver. I believe it is arseniate. They were working entirely by manual labour, and had no machinery to draw off the water. The mines of Almaden de la Plata (silver), so called to distinguish it from Almaden de Azogue (quicksilver), have been reopened, and are, I understood likely to make some return. The most valuable mine in Spain at present, is that of Puebla de los Infantes, a few leagues west of Cordova, where there is a prospect of considerable profit. All the mines of Guadalcanal and its district including Cazalla, Almaden de la Plata, Puebla de los Infantes, which are silver, Almaden de Azogue, and Rio Tinto, which is copper, are in a comparative small extent in that part of the Sierra Morena, opposite to Seville, which there is no doubt contains other unknown deposits of mineral riches, but the country is so covered up that it is to be feared they will remain undiscovered. Silver has lately been found, with copper, in the Alpujarras, but I believe as yet only in a small quantity. The workings of the Romans, with lamps, and various other utensils have been found in the range of the Sierra Nevada, on its southern face, from Cadiar to the Sierra de Filabres, but as yet these galleries have exhibited no remains of minerals, of any value, having been no doubt wrought

as long as they were profitable, and then examined again by the Moors. The copper mines are extremely valuable. The principal is that of Rio Tinto, where, I have been informed, there are large masses of pyrites with sulphuret of copper in solution, which is precipitated in the usual manner. The iron plates used for this purpose, have been procured abroad, but in 1832 they were contracted for by the company of Pedroso. At Linares on the lower part of the Sierra Morena, are mines of lead and copper of great value. The Moors wrought the lead, but appear to have left the copper as useless. It is of excellent quality, and is chiefly in the form of blue and green carbonate. There has lately been a discovery of copper as mentioned above near Cadiar in the Alpujarras, which has given rich samples of ore of both kinds, but in small quantity. In Aragon are some mines of copper, I am ignorant of the exact locality, but I believe it is near Teruel. I have no certain information respecting them. They are in the hands of a company, who have derived little advantage from them, owing, I have heard, to mismanagement. They are probably in the same range with those of Molina de Aragon, which produced valuable carbonate of copper with malachite, but are now abandoned.

The quicksilver mine of Almaden, in the northern flank of the Sierra Morena is still in possession of the king, the produce being sold by contract at a fixed price. This mine is inexhaustible, and if the Americas were pacified, and an arrangement made, it would still be of great value, as I believe any quantity can be procured, without the slightest difficulty. Quicksilver is found in the alluvial deposits of the plain of Valencia

in sinking wells, where it infects the waters, but it is not regularly worked. The lead mines of the Sierra de Gador are mentioned in the visit to that place. They are in a state of repletion at present from the enormous quantity of the mineral, and the facility of raising it, and the price of lead in Europe must remain in the state it now is, or nearly so, whilst these mines remain unexhausted. A detailed account will probably be laid before the public by a learned German professor, who has recently been employed by the Spanish government to examine and report the real state of these mines. They had been underrated by a former traveller of the same country, soon after they were discovered. Lead abounds in other parts of the same chain, nearer to Almeria. I was also shown at La Junquera, in the Serrania de Ronda, a very large and fine specimen of carbonate of lead, which the people assured me they had found on the surface of the ground, and that it abounded there. The lead of Linares was used by the Romans, and afterwards by the Moors, but these Africans were bad miners. It is now chiefly consumed in the interior, where they boast that is of finer quality than that of Gador. In both these districts, of which that of Linares occurs in granite, and of Gador in limestone, it is in the form of galena. There is lead also in the high Pyrennees, and some has been found in Guipuzcoa, but I believe of little moment. I have been informed there is zinc in great quantity near Alcaraz in La Mancha, near the termination of the Sierra Morena, and plans were in execution to work it, but are for the present suspended, owing to the death of the principal projector. It is also said to abound in Asturias, but the mines are not at present wrought. Traces of tin

have been observed in Galicia, and the vast district between that province and Asturias, which is now under examination, will, it is expected, produce valuable discoveries. The celebrated mine of cobalt, in the valley of Gistau, quite in the high Pyrennees, has been discontinued working, for a long period, and I could obtain no certain information respecting the state or probability of its success in the present times, where the competition is so great. Near Marbella in the neighbourhood of Malaga, is a mine of graphite, (black-lead,) of the finest quality, occurring in a formation of serpentine. From an exaggerated idea of the value of it, the government have retained possession, and demand such a price for the rent, that no one yet has taken it. They believe it to be indispensable to the rest of Europe, and that their conditions must be finally acceded to. I was informed it composed an entire *cerro*, and is of excellent quality, but it is now closed with such rigour that I had great difficulty to obtain a specimen. Near Campillo, between Jaen and Granada, graphite has also been observed. In the high Pyrennees, is another mine of the finest quality, but it is not wrought. A large specimen I saw in those mountains was equal to the finest from Borrowdale. There are vast quantities of alum and of saltpetre in various parts. At Hellin between Murcia and Valencia is sulphur, which occurs also near Almeria, in a part of the volcanic formation of Cape de Gatt. Salt is found in prodigious quantities, besides the *salinas* or salt marshes near the sea, where it is produced by simple evaporation in the manner of those of Setubal in Portugal, etc. The principal of these is that of Torre Vieja in Murcia, which is described in a visit to it, and the *salinas* of the Ebro

and of Cadiz. There is rock salt and springs in great quantity, both in the secondary and more recent formations. The most celebrated is that of Cardona in Catalonia, where a solid mass of five hundred feet in height, without a flaw or any substance mixed with it, is projected above the surface, and is quarried like common stone. The property is now of little use to any one according to the ancient practice of Spanish management. It belongs to the duke of Medina Celi, but was partly robbed from him by one of kings of Spain. As it was a clear case of what the French term "expropriation forcée" he has retained a lien upon it, and each party have their toll house and exact a part of the profits. The consequence is, the government prevent the circulation, and little is sold, the consumption being confined to a very small radius, where there is hardly any demand, and inspectors and sub inspectors are paid for doing hardly any thing. There is an extensive deposit of rock salt at Mignanilla, on the southern side of the Sierra de Cuenca, but I believe it produces very little in the present system. Near the source of the Ebro, in the sandstone is a considerable deposit which supplies the free provinces.

A prodigious loss to the revenue, and of prejudice to individuals, with a notable increase to the number of *presidarios*, is caused by the present rates of duty, which are forty eight to one or thereabouts. The demand is very great, as in many parts of Spain, especially in Estremadura, and in the Moorish provinces, as well as in Catalonia, great use is made of salted meats, prepared from their beautiful breeds of swine. These are slaughtered in the ancient manner, about Christmas amid a convivial meeting of neighbours and,

friends, which lasts in some families several days, and in which every one assists. In the southern provinces it is not uncommon on enquiring for people at their houses, to find them shut up, and to be informed by the neighbours, that they are gone to a *matanza* at some distance.

The most valuable of the whole mineral riches of Spain will be in all probability in a few years the iron, which is found every where, and of the best qualities. At present the principal establishments are Marbella near Malaga, where there is an entire mountain of it. This iron is of the finest description, and they are establishing rolling mills, and producing hoops for the wine casks, and other articles hitherto brought from England, equal to those of our manufacture. An extensive establishment was formed some years near Pedroso in the Sierra Morena. The iron is of inferior quality to that of Marbella and some other mines, and the situation unhealthy in summer, but it promises to be of some advantage to the proprietors, and the neighbouring country. Very large sums were thrown away in a most absurd and ridiculous manner by the company, who were trades people, and others of Seville, and appear to have formed a sort of republic, each framing his own projects, and wasting a large capital without plan or system. At present, however, it is altered, and they have an able and efficient head, who is remodelling the whole machinery, and establishing it on a proper basis. These establishments will supply all Andalusia and lower Estremadura when they are fairly at work. I understood they were going to form a large foundry near Alcaraz, which will furnish La Mancha, the capital, New Castile, and upper Estremadura. In Catalonia there is abundance of iron,

and in all the northern provinces inexhaustible quantities, in fact it is found in almost every part of the country. Near Bilboa is the celebrated mine of Somorostro, which has been wrought for centuries, and has no chance of being exhausted. It has always been free, by ancient custom, and maintains numerous petty establishments. The iron is peculiarly soft, and from it the famous gun barrels are principally made. The government arms are chiefly made at Elgoibar, and in that vicinity. The manufactures of Biscay are suffering from the want of machinery, and modern improvements, and from the rigorous prohibition of their iron, in the hopes of compelling them to embrace the dire alternative of receiving the Castilian commercial tariff. Government have large and expensive establishments in various parts of these provinces, which they are gradually giving up, and the new companies are obtaining contracts for shot and other articles of war. One is still kept up in Roncesvalles, on the very frontier, which could at any time be occupied by the French, without the smallest difficulty. The foundries of brass cannon, which produced the most beautiful guns in the world, are, I believe, now quite suspended, excepting that of Seville, where a certain number are cast, *pro forma*, monthly. The most serious impediment to the mines, such of more especially as require fuel for smelting their ores, is the want of combustible, which if not remedied by the firm and determined hand of government, will prevent their ever reaching the point of prosperity they ought to do. This will be more particularly mentioned under the head of forests.

The coal mines of Asturias are mentioned in the tour of that province. The quantity is inexhaustible, the

quality excellent, the working of extraordinary facility, and they possess an easy communication with the sea, yet they are practically useless, and afford only a miserable existence to a few labourers and mules used in conveying the mineral to Gijon. The mine of Villa Nueva del Rio, which is on the Guadalquivir, about twenty five miles from Seville, is a regular formation, with a seam of excellent quality. It labours under two disadvantages, the water, which will require an engine to clear the workings, for which there is no remuneration, and the *malaria*, which infects the district in the summer months. The mine occupies an area about a mile in breadth and of uncertain length. The edges come to day on both sides, and are wrought as far as the water permits, which is a very short distance, when they sink another shaft, thus leaving all the middle part of the mine unworked. The seam is about three feet, the coal is excellent, and is used for the steam navigation of the lower Guadalquivir. A steam engine was brought from England and set up, but failed from some cause or other, and when I visited it, was in ruins, the machinery having been carried to Seville. A considerable stream passes over the center of the formation, and probably causes the quantity of water in the workings, as by the dip, the bed of the river must be very near the lower part of the seam. Traces of coal were found near Malaga in 1830, and in a formation which would indicate a true deposit, but it is to be feared no favorable result has yet attended the examination of it. These are the only genuine formations of which I have any certain information or knowledge, but there is another in upper Catalonia, which gives jet or something like it and is wrought for ornaments. I am ignorant of the extent or

situation of this deposit, as of one I have heard exists in Aragon above Zaragoza, probably in the sandstone mentioned in the geological abstract. In the lower Pyrenees, near Irun are traces of coal but of bad quality and amidst rocks of the chalk epoch. The coal which has been examined in some other parts at Granada and near the Almanzora is lignite occurring in very recent deposits, and unfit for any economical purpose.



P. C. Monumental de la Alhambra y Generalife
CONSEJERÍA DE CULTURA

CHAPTER XX.

Spanish Architecture.

The Roman style, of which there are a few noble remains, has so little direct connexion with those which have followed it, that it is needless to treat of it, although it claims priority in the epochs of the architecture of Spain. It was succeeded by the Moorish, the Moslem architects having borrowed some part of their mode of construction from the former masters of the Peninsula. The walls of the Alhambra are like Roman brickwork of the middle time. The wall near the entrance, which is reported to be Phenician, is certainly neither Roman nor Moorish, and, whatever it be, is of great antiquity, but there appears no reason to believe that the towers of the centre, which do not differ from the manner of that part known to be modern, are of the age assigned to them by traditional report.

The horse shoe arch, which is the peculiar characteristic of the Moorish style, has no connexion with that of the Romans. It is not geometrical nor can it be said to present the idea of solidity requisite to please the practised eye, which considers that quality indispensable to produce true architectural effect. It cannot be denied that the smallness of the columns, and their

insufficiency to support a disproportionate entablature, the weight of which is placed out of the true line of support, give a *meschine* effect to the best specimens of Moorish architecture, which accounts for the prejudice of the Spanish writers and of the public, who cannot understand the interest inspired by it to foreigners, and the pilgrimages made from all parts to these remains, which proceed from causes quite unconnected with their architectural merits.

The whole of their colonnades and works where columns form the support, at Granada, Cordova, which was the Damascus or holy city of Moorish Spain, and Seville, have the same defect. The mosque at Cordova enumerates in its thousand columns very many of Roman work, and the capitals and proportions of those which bear the marks of Moorish make, are poor and mean, compared to the good columns of antiquity.

There is a great variety in the form of the Moorish arch, which seems subject to no rule, but it is invariably swept in curves out of the line of support and bears on a base, itself unsupported geometrically, and which depends on an ill proportioned column, often appearing to totter under the weight which rests upon it. The details of ornament differ very much in the respective edifices, and are of exceeding beauty. Restricted as these artists were, who were prohibited to use animated forms, the variety and fancy of their design cannot be excelled. The finer work of the Alhambra, of the *zancarron* or sanctum of the mosque of Cordova, and some of that in the *alcazar* at Seville, and in a private house in the same city, may vie with the finest ornamental productions of the Greeks and Romans, and are quite in opposition with the inferior effect of their exterior

outlines. The Arabs who were certainly at the period of their dominion in Spain, one of the races who have most illumined the earth, only add to the many proofs, that we must for ever revert to the original models of the Greeks for architectural perfection, and that talent or ingenuity can rarely be exerted to any purpose, but by continuing their maxims and perpetuating their inimitable designs. These observations of course apply to the mere art or science of architecture. To us, who are at issue with the Spaniards on this subject, the edifices of the Moors, and their whole history, preserve an interest possessed by no other, indestructible and eternal.

The prodigious number of military works which are scattered over nearly every part of the country, have the same defect as their civil architecture. They are generally in situations admirably chosen, both for defence of the post they occupy, and the equally important object of political or territorial jurisdiction. Beyond this, they have little to praise. They are composed of petty and meschine parts, and were suited to the ideas of a people of cavalry, but ill fitted to any other purpose, and the rude culverins and other instruments of the early time of gun powder, were sufficient to render them inefficacious. The flanks are generally small and irregular, and the forts themselves extended in long and unconnected lines, showing little knowledge of the real principles of fortification on the part of their constructors. The masonry is in general deficient, and is composed of small and badly-cemented blocks of stone. Amongst the principal now remaining are the castles of Murviedro and Xativa near Valencia, Xixona near Alicante, Almeria, Malaga, Ronda, Zahara, Jaen, and some others, besides the walls of Granada, Seville, Cordova, Valencia and

cities, some parts of which remain entire, and others are altered and modernised. It cannot be said that there is a direct passage from the Moorish to the Gothic, which succeeded it chronologically. In fact both coexisted, for after the tide of Moslem conquest was rolled back from the mountains of Asturias and the Pyrennees, which commenced before they had time to effect much change in the interior, and whilst they had quiet and undisturbed possession of the south, several of the great Gothic cathedrals were commenced. Little progress was however made, and the intestine divisions and foreign wars, which desolated Spain in common with every part of Europe for some ages, prevented much advance in the arts of peace. There are some early castles, and parts of churches remaining in the north of Spain, which are given as specimens of ancient Spanish architecture, but I am unacquainted with any of them, and they are of little interest, as no series or connection is attempted to be traced from them to the succeeding or Gothic epoch, and they are rather studies for the antiquary, than the architect. A curious passage from Moorish to Gothic was observed at Cuenca, which is too remarkable to pass over, but it will be described more particularly afterwards. It is unnoticed by any Spanish writer to my knowledge, and is the only example which came under my observation. This edifice dates in the twelfth century.

It is not quite clear to whom is to be attributed the plan of banishing the Gothic, and substituting for it the Italian or Greco - Roman style of the *cinque cento*. It was consequent on the communication being opened with Italy in the time of Charles the fifth, and the principal operators in the revolution were, Juan de Toledo,

and Herrera, his disciple, Diego de Siloe, the architect of the cathedrals of Granada and Malaga, the elder Valdelvira, who, as far as can be collected, built that of Jaen, and Machuca, who built the modern palace of the Alhambra. Although the Gothic or semi Gothic held a partial sway at this time, it soon yielded, and little more was constructed but in the new style. The cathedrals of Granada, Malaga, and Jaen, and the chapel of the hospital de la Sangre at Seville, are in a sort of transition style between the Gothic and Italian, and will be more particularly described. The Escorial and the cathedral of Valladolid, the *alcazar* of Toledo, the new palace of the Alhambra, the Lonja of Seville, and some convents in different parts, are the finest specimens of the revolution being completed, and the Gothic passed away for ever. The great time of classic Spanish architecture was in the early part of the sixteenth century, and it was ably sustained by Philip the second. After the death of that monarch, a decline took place, which continued until the end of the seventeenth century, when it had reached the nadir, in which state it remained with little exception, until the academy was instituted, and Ventura Rodriguez and his pupil Villanueva, and some Italians and others of the time of Charles the third and fourth, banished this bad style, and introduced a system of good and correct design which has been followed subsequently to that period.

A work has lately appeared, which was very much wanted, "a guide to the architecture of Spain". It was originally arranged by Señor Llaguno, who left his papers unpublished; they fell into the hands of Cean Bermudez, who died before he had published them, and they have appeared subsequently as a posthumous

work. I have used the dates and authorities from this book, which only came under my notice after these notes were made in most instances; but there are many errors, some of which will be pointed out, and omissions inseparable from a compilation of the kind. We will now proceed to sketch the various epochs of modern architecture, which include the Gothic, the passage from Gothic to classic, the classic or Greco-Roman style, the decline and corruption of that style, and its resurrection by a modification of the same school of design, in the last century, which is still continued. This will be done as succinctly as possible, avoiding the dragging the reader through details of measurements and criticism, and the specimens indicated, all of which the author has examined, will suffice to give a scale, to which the other edifices may readily be referred. Before proceeding to the cathedrals, it is necessary to observe that in Spain, an almost universal arrangement prevails through these splendid structures. The great altar in nearly every instance, is isolated, and is placed east of the *crucero* or transept. Where there are five aisles, the two center aisles are sometimes connected, forming what are called *collaterales*, which flank the great altar. The choir, where the canons and chorus assemble, is on the opposite side of the transept, and is also isolated. These two parts, the choir and great altar, are almost invariably connected by a low railed passage, for the convenience of the canons during the celebration of their ceremonies. The rest of the church, except some private or reserved chapels, open at certain hours, is free to the public at all times. The choir is the part of these edifices in general the most open to criticism. The canons have almost always attended too much to their own convenience, and have

often sacrificed the beauty of the edifice to the desire of providing for it. Scarcely one is not befouled by adventitious ornaments and incongruous and unsightly deviations from the simplicity of design of the church itself. These are in general modern additions, but the admirer of art must diligently search these places, inside and out, for in them are the most precious specimens of the Spanish schools, in chasing, sculpture, and other branches. The *trascoro* is the back or outside of the choir. The *rejas*, or brass or iron gates and railings, which inclose the choirs, altars and chapels, are in many instances of extraordinary and peculiar beauty. It was in the great time a branch of itself, and the *rejeros* justly figure in the list of illustrious artists. Amongst the most celebrated were Villalpando, Domingo de Cespedes, and Arenas of Cuenca. These *rejas* are of wrought iron or brass, and are ornamented with figures after the most excellent designs. The sacristies are extremely numerous in the great cathedrals. Besides the general or principal sacristy for the ordinary service of the church, many of the larger chapels have their own attached, generally communicating from behind the respective altars. The *sagrario*, or chapel where the sacrament is administered, and the host kept, in many of the great cathedrals, is a separate building, communicating with the church, so that the two services do not interfere with each other, and those engaged in that solemn rite are not disturbed by the motion in the more frequented part. In some instances, this *sagrario* serves as the parish church, where that duty is united to the cathedral, and where the necessary routine is performed apart from the solemnities of the chapter.

The word *retablo* will be frequently used, as we have none which fully expresses it. The meaning is the structure which fills up the space allotted to an altar, which, in the Spanish churches, is frequently composed of three and even four ranges of architecture, over each other, with columns, entablatures, and other parts, and ornamented with statues, reliefs, and paintings; some of the finest works of the schools being found in these situations.

The *custodias*, or services of plate in the principal cathedrals, and even in the *collegiadas*, which rank between them and the *parroquias* or parish churches, and may be compared to the ministers of Ripon and Beverley, and others in England, are extremely beautiful, and in some instances, extraordinary specimens of art. This was a separate department, and the principal professors are enumerated, who have enriched the country with their productions. The principal are the Arfe, natives of Leon, and the Becerril, of Cuenca. These *custodias* were in most instances respected in the war of independance, more from the weight of the ecclesiastical bodies, and dread of their power over the people, than from any other reason. The finest glass appears to have been brought from the general mart, the low countries, to which most of the designs of the best windows belong, but there were latterly some good native artists, and these churches are now inferior to no others in that beautiful departement.

LEON.

The cathedral of Leon is one of the earliest and best specimens of pure Gothic in Spain. It dates in 1100,

and bears a resemblance to some of our own specimens of that period. There are three naves. It is disproportionately narrow. The arches are nearly in the form of those of Salisbury, but narrower. The windows are nearly all glazed with painted glass. The cloisters are more modern, and the exterior work, which is much vaunted in Spain, would not be rated so highly in France or England. The vestry of the canons, is different and more modern than the rest, and has admirable specimens of coloured glass of Flemish design. This beautiful edifice is disfigured by a modern barbarism, called a *transparente*, which is a mystical representation of the sun striking on the great altar, through a miserable contrivance for the purpose, which has replaced the original Gothic *retablo*. The *trascoro* is of alabaster, but of inferior design, and I found neither sculpture nor painting worthy notice in this beautiful edifice. The architect is unknown, but there seems great reason to believe he was from the north of Europe.

CUENCA.

The cathedral of Cuenca was commenced in the latter end of the twelfth century immediately after the conquest of the city from the Moors, and probably occupies the site of the great mosque. There are two parts or plans in this curious building; that to the east of the transept being the older, and no doubt the original design. In this are five naves, with a circular end round the great altar. Some of the arches which support this part are a clear and decided passage from Moorish to Gothic. They do not spring from geometrical supporters, but from the outer edge of a bold cornice, which