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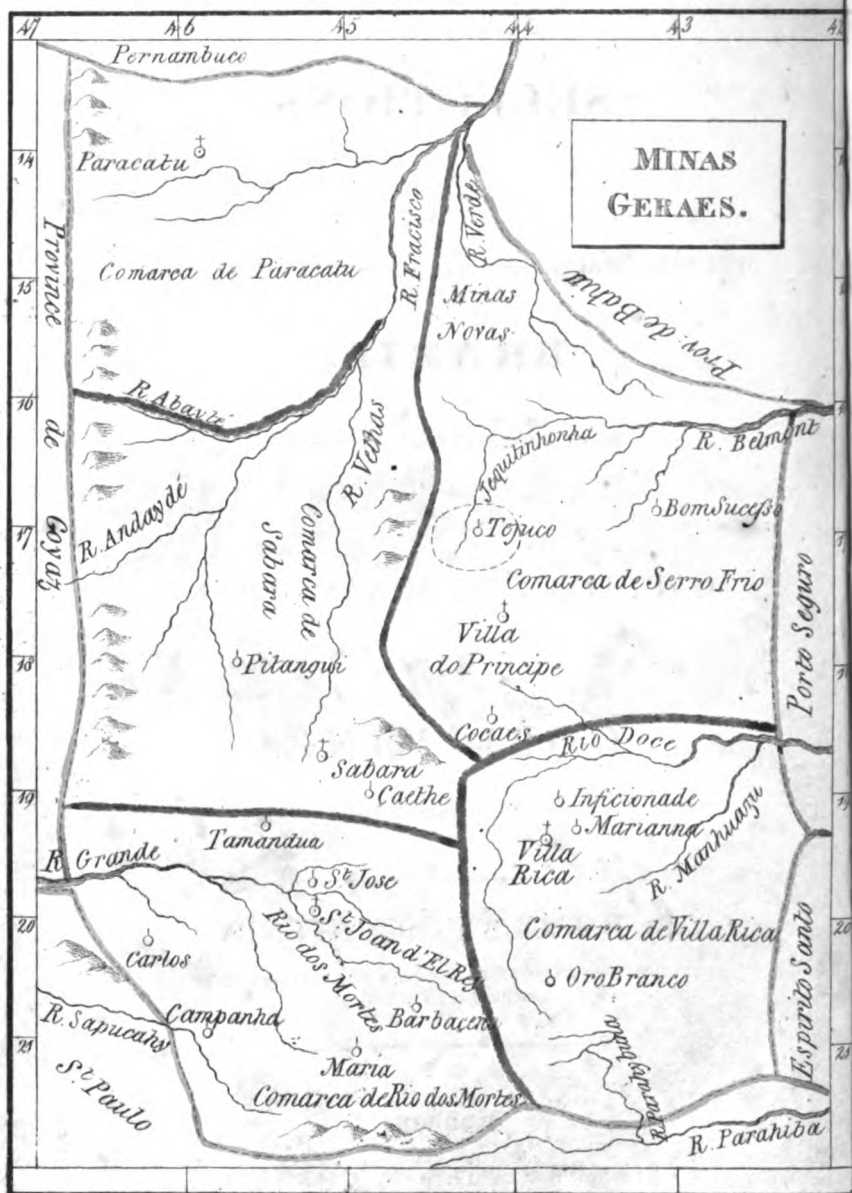
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Selections from the various authors who



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SELECTIONS

FROM

THE VARIOUS AUTHORS WHO HAVE WRITTEN CONCERNING

BRAZIL;

MORE PARTICULARLY RESPECTING

THE

CAPTAINCY OF MINAS GERAËS,

AND THE

GOLD MINES

OF THAT PROVINCE.

By **BARCLAY MOUNTENEY,**

AUTHOR OF THE HISTORICAL INQUIRY RELATIVE TO THE LATE
EMPEROR NAPOLEON.

Dr Mounteney, Thomas J. P. ...

London:

EFFINGHAM WILSON, CORNHILL.

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PREFACE.

THE importance of South America to the commercial community, particularly to that great portion of it resident in Britain, will at once explain my motive for publishing the present work.

This little book is called "Selections," because, in truth, it is such; for it scarcely contains twice twenty-four lines which have proceeded from me. I have nowise sought to compile a lengthy volume from the pages of abler men than myself, but rather to produce, in as compressed a form as possible, whatever has appeared, to my view, most worthy the attention, on a particular subject, of those whom that subject more especially interests; and if, in accomplishing this end, any judgment has been evinced, to the merit which may flow from that source, and from no other, I lay claim.

It was my intention, at the outset, to render unto Cæsar the things which are Cæsar's, —to give to each author his literary due; but

as I found, on proceeding, that this would be productive of considerable confusion, I have preferred registering, in an Appendix, the claims which my authorities have to public notice. The reader, however, may rest assured, that no circumstance is advanced by me which is not confirmed by the respectable writers enumerated.

Amongst the many provinces of which Brazil is composed, there is none of more consequence than the Captaincy of Minas Geraës, whether its geographical position or the metallic riches contained in its soil be taken into consideration; on the latter head, indeed, some persons have recently affected to put forth their doubts, although, in doing so, they seem to me to have sadly argued without their host,—from abstract positions, but at most partially correct, they have imagined Brazil to be little worthy of attention, because, forsooth, mining is not conducted there on the same principles as in England; and, because the gold found has not been equal to the quantity heretofore, that therefore the precious commodity has been, what existed of it, already extracted

from its bed. It is as possible to draw wrong conclusions from just premises, as right ones from false. Washing, or what is termed streaming, however imperfect a method of proceeding, and however, in Brazil, injudiciously carried on, has still, as it will be seen, produced, and continues to produce, the greater part of that gold which circulates at this day in Europe. Nor must *washing* itself, for any metallic substance, be looked upon as the device of the most ignorant of beings, if those who are ready to make the assertion are not equally ready to prove that the English nation, hardly more than a century ago, was the least advanced of any in scientific knowledge; for it is a fact which may be new to many folk, although not on that account less a fact, that scarcely one hundred years have elapsed since the same plan which is now condemned elsewhere, was practised in England, for collecting of iron, as well as, in earlier times, of tin.

With respect to the supposed falling-off in the quantity of gold, the hypothesis is founded on the supposition, that a country

is less rich in any matter in proportion as the quantity of that matter is removed ; now, although this reason, on the face of it, seems plausible enough, it by no means follows that it is either true in theory, or, with reference to its influence, practically just. In this world nothing is permanent, nor is any thing lost: the waters of the ocean are absorbed by the sun, but only again to descend in drops to fertilize the land; gold may be sifted from sand or extracted from the bowels of the earth, yet nature will not permanently be a loser, for she knows no vacuum, and that which is taken from her at one period she reproduces at another. If actual experience did not teach this lesson with regard to gold, analogy would quickly point it out ; and it would be just as reasonable to believe that mankind could ever be wholly deprived of whatever was really useful to them, as it would be to imagine that the sun of the firmament would cease to shine, or that the Great Disposer of events had ceased to afford his protection to his creatures.

THE AUTHOR.

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ERRATA.

Page 15 for coasting African trade *read* coasting and African trade.
— 78 for Platiana *read* Platina.

SELECTIONS,

§c.

CHAP. I.

HISTORY.

THE immense territory of Brazil was first perceived by Vicente Yanez Pinzon in 1499, and in the following year was taken nominal possession of by Pedro Alvarez Cabral, who had been appointed by Emanuel, King of Portugal, to the command of a fleet destined for the Indies.

In 1555, the French effected a settlement in Brazil, but were, after a few years, expelled by the Portuguese.

In 1581, the crown of Portugal having devolved on the head of Philip of Spain, that monarch became the master of Brazil, which remained under the yoke of his house as long as the two kingdoms continued to be united.

In 1624, the Dutch invaded Brazil, and landed at San Salvador. They kept in subjection the most central provinces about thirty years, when they likewise were finally compelled to abandon

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their conquest, since which time the country has enjoyed, with the exception of such petty hostilities as the presence of the native inhabitants has engendered, an almost uninterrupted period of profound quiet.

In 1807, the family of Braganza was driven, by the invasion of its hereditary dominions by the forces of Napoleon, to seek an asylum in the New World; the events however which afterwards took place permitting, early in 1821, the return of the king to Europe, he availed himself of them to quit the land which had afforded him shelter, leaving Don Pedro, his eldest son, at the head of the colonial government, under the title of Prince Regent.

This step was soon attempted to be set aside. The Cortes at Lisbon, as a means of retaining Brazil, had passed decrees for the election of separate governments for every province, and for the appointment of a military commander in each, who should be independent of the provincial government, and accountable only to the Cortes for his conduct: they had likewise ordered that the prince should return to Lisbon immediately that these governments were established.

These decrees were known at Rio de Janeiro before the end of December, 1821, and excited universal discontent. The provisional govern-

ment of S. Paulo drew up an address to the prince, in which, after reprobating the conduct of the Cortes, they protested against the order for the recall of his royal highness, and entreated him to remain amongst them. The prince replied, that he had sent the address to his Majesty. In the meanwhile great anxiety prevailed in the capital, and a meeting of the municipal body was held: they agreed on presenting a memorial, stating to the prince the dangerous results likely to follow his departure, and conjuring him to continue in Brazil. To this request, after a short hesitation, his royal highness acceded, upon which public rejoicings followed.

In the midst of these festivities, a movement of 2,000 Portuguese troops excited much apprehension. They assumed a hostile position near the palace, and protested against the prince's decision of not returning home. Blood seemed on the eve of flowing, when an agreement was happily concluded, by which these men consented to embark for the mother country; an agreement which they subsequently appeared inclined to annul, had not the energy and courage shown by the Prince Regent soon convinced them that their safety depended on their honesty.

Whilst these proceedings occurred at Rio,

transactions very similar to them passed at Pernambuco, where positive orders were issued not to permit, in future, the landing of any military from Europe.

Under these circumstances, it was clear that the sovereignty of Portugal had expired in Brazil.

In February 1822, the Prince Regent issued a decree, which directed that the several provinces of Brazil should choose a certain number of representatives to compose a *junta*, at which he would preside. This was called the *Conselho de Procuradores*.

In May the prince assumed the title of “*Constitutional Prince Regent, and Perpetual Defender of the Brazils*.” This was scarcely done, when the senate of Rio presented to him an address, in which they insisted upon a complete separation from Portugal, and further requested that there should be convoked a general assembly of the provinces of Brazil, represented by an adequate number of deputies, being not less than one hundred, nominated by new parochial electors chosen by the people, and whose attribute should be to deliberate in public session.

To this fresh solicitation the prince replied, that he would attend to the suggestion as soon as he should become acquainted with the desires of the other provinces, which information being

speedily obtained, his royal highness issued, on the 3d of June, a decree convoking a general Constituent and Legislative Assembly,

Thus another step in the career of independence was taken.

On the 1st of August a manifesto was published, in which the sovereignty of Brazil was proclaimed, accompanied by another, addressed to foreign nations, and by a decree, declaring that henceforward all Portuguese troops disembarking in Brazil without permission, should be considered as enemies, and treated accordingly.

The complete and final separation of Brazil from the crown of Portugal was announced by proclamation on the 21st of September, in which the style of "*Constitutional Emperor of Brazil*" was given to the prince*. "I accept," said the prince on his inauguration, "the title of Constitutional Emperor and Perpetual Defender of Brazil, because, having heard my Council of State and Procurator-General, and examined the representations of the corporations of several provinces, I am fully convinced that such is the general will of all the others, and

* Pedro di Alcantara, Emperor of Brazil, was born October 12th, 1793; married, November the 6th, 1817, the Archduchess Leopoldina, of Austria, born 22d of January, 1797; and has issue Maria da Gloria Leopoldina, Princess of Beira, born 4th of April, 1819; Don Joam, born 1821, deceased 1822.

that it is only from want of time that it is not yet arrived." The American sovereignty of Portugal in this way expired.

It was not to be expected that Portugal would willingly resign her transatlantic dominion. The Cortes issued several decrees, and came to many resolutions on the occasion, but to little, or rather no effect, as none of their measures anywise endangered the independency of Brazil, which is now, both from recent circumstances and its increased means of opposition, fully capable of maintaining the inviolability of its territory.

During the last three years the government of Don Pedro has laboured to improve the civil institutions of the country; and a constitution has been adopted, whose leading features are personal, professional, and religious freedom, inviolability of property, liberty of the press, and trial by jury.*

To imagine that these blessings are practically brought into action in the new state of Brazil, with the same force which distinguishes their existence in England, would be to draw an erroneous and an illiberal conclusion: it is sufficient for the philanthropist that the immutable principles of

* Trial by jury in criminal cases is to take place, but not in civil suits, which are to be adjudicated as heretofore in the different tribunals, which are regulated by the Roman law.

equity and justice have been formally acknowledged as the foundation on which is to be erected the infant constitution of this great portion of South America ; and time, with the progress of knowledge, will accomplish the rest : in the meanwhile, it is cheering to know that the present king is highly popular with his subjects, and still more satisfactory to feel convinced that he deservedly merits his fair fame. His energy and bravery have already been noticed ; but the outline of his character would be but ill delineated were his manly rectitude omitted to be portrayed. On the departure of the king from Rio, the treasury was left pennyless. Foreign merchants, as well as natives, were creditors of the state. The prince acknowledged the justice of their demands ; and, although he could not satisfy them at the moment, he began as soon as he was able to make payments by instalments, and these were still in course of payment in 1823, notwithstanding the change of government.

CHAP. II.

NAVIGATION—PORTS, &c.

BRAZIL, to which many travellers have for some years past directed their attention, has the advantage of being separated from Europe, by one of the less stormy seas. There are, indeed, some months, especially about the time of the equinoxes, when this immense ocean is subject to frequent tempests; yet they are not, upon the whole, so dangerous in these regions, as in other parts.

The first Englishman who is mentioned as having traded to Brazil, is Master William Hawkins of Plymouth, father of Sir John Hawkins, a man much esteemed by Henry VIII., as a principal sea captain. He armed a ship of his own, of 250 tons, called the *Paul* of Plymouth, wherewith he accomplished two voyages, one in 1530, and the other in 1532.

The best season for sailing from England, and that which affords the greatest probability of making a short passage, is the month of February or March, the north winds prevailing at that time. Vessels from Liverpool have reached Per-

nambuco in thirty-five days, and Rio, in forty-five or fifty days, which is considered a fair voyage.*

In proceeding from Europe to Brazil, navigators must be determined, in what degree of longitude it may be proper to cross the line, by the winds which prevail at different seasons of the year. When the sun is far to the south of the line, the S. E. winds begin to blow in about seven degrees of north latitude, and sometimes force ships to the 27th degree or more of western longitude, before they have passed the equator. When, on the contrary, the sun is to the north, the line may be crossed in a much more eastern longitude, as the winds then generally blow from the N. E. ; but, on arriving at the 17th degree of latitude south of the equator, the winds become influenced by the continent of Brazil, which appears in latitude 22 degrees 40 minutes south.

Ships bound to La Plata or Rio de Janeiro do well to cross the line at not less than 22°, nor more than 25° west longitude, as very long calms have sometimes been experienced between 19° and 20°. Those vessels destined for Bahia, Pernambuco, &c. will of course proceed more to the westward, as they will have nothing to fear, but the south-west trade wind would generally cause shipping

* Vide Appendix.

going further south to fall in with the land too soon.

Some of our most experienced navigators recommend, that ships sailing to Rio should, after making *Cape Frio*, instead of steering along shore, shape their course between S. W. and S. W. by W., for twelve or fourteen leagues, as to this distance the land breeze extends. The land breeze at Rio begins late in the evening, frequently only about daylight, and prevails until eight or nine o'clock in the morning, when it ceases; and in a short time the sea breeze commences, and blows until sunset. The regularity of the breezes is much modified by the seasons.

The ships best calculated for trade from England, are those which carry about four hundred tons and sail well; it is particularly necessary that they should have the latter quality, for, if they have not, the voyage from America is frequently rendered very tedious, by their being driven too far to the westward, by the north-east trade wind. Owing to this circumstance, it is not uncommon for a packet, or fast-sailing vessel, to reach England, from Brazil, in five or six weeks, when a heavy sailing one is double that time in arriving at her destination.

The most frequented ports in Brazil, are Per-

nambuco, Bahia, Para, and Rio de Janeiro ; they may be pronounced secure, as are in general the moorings on the coast: nevertheless, it is highly desirable to be provided with good anchors and cables, particularly in the Rio de la Plata.

When a vessel enters any of the harbours, the health and custom boats make a visit before she anchors, and the report of the officers is immediately transmitted, after which, persons called *Guardas* are sent on board. These men are not in general very liberally provided for ; they are extremely civil and accommodating, and ought to be treated with respect.

The port dues are not so expensive as formerly : * a dollar per day is now exacted for anchorage, which forms the principal charge. The tide flows seven hours and a half at Rio, and rises about five and a half feet perpendicular.

Ships are loaded at most places in Brazil by lighters, which, when many are receiving their cargoes, are very expensive and difficult to be

* Expenses in Rio Janeiro, 1805.

Entrance and exit, including pilotage,	} 25,600 Reas	£7 4 0
Linguister, daily	1,000 do.	0 5 7½
Anchorage, do.	1,000 do.	0 5 7½
2 Guards, do.	1,920 do.	0 10 9½
First expense	25,600	£7 4 0
Daily one	3,920	1 2 0½

procured ; good boats are therefore extremely useful and necessary.

The voyage from Rio de Janeiro to the northern provinces of the empire is regular and expeditious for one portion of the year, while, for the other, a very considerable offing must be made.

All homeward bound ships should lay in a sufficiency of necessary stores, especially of water, before they quit the coast of America, so as to make the passage without being obliged to go into the Western Isles ; as there, the charges and attendant expenses are very exorbitant, though the only articles wanted may be a few casks of water, and a hundred weight or two of bread.

CHAP. III.

GENERAL GEOGRAPHY.

THE empire of Brazil reaches from the equator to 35 south latitude, being, from the mouth of the Amazon River, to that of the Rio de la Plata, a distance of about 2500 miles in length : its breadth varies, from 90 to 1000 miles.

From 1500 to 1530, the country, being much neglected, was divided by Joam III. into hereditary captaincies, in order to ameliorate its condition ; and Martin Affonso de Souza, in 1531, was the first person to take possession of one of these fiefs, many of which comprised fifty leagues of coast.

At the present time, Brazil is divided into twenty-two captaincies, Minas Geraës forming one of the interior.

St. Sebastian, or Rio de Janeiro, is the seat of government : its population is estimated at about 140,000 souls, two thirds of whom are negroes.

Brazil has the advantage of being watered by many noble streams : the Amazon to the north, and Rio de la Plata to the south, are the finest rivers in the world.

The mountains of Brazil are not so lofty as are those on the opposite side of the continent ; that chain, however, which divides it from Paraguay and the country of the Amazons, on the west, is considerable, as is likewise that which faces the Atlantic. The captaincy of Minas Geraës is also very mountainous.

In an empire so extensive as Brazil, the climate must vary according to the nature and geographical position of its numerous provinces : thus whilst some portions, and particularly the valleys, are inconvenienced by the heat of a tropical sun, the more elevated spots enjoy the salubrious and bracing effects of the temperate regions. On the whole, however, the climate is remarkably healthy, of which there cannot be a stronger proof than the frequent instances of extreme old age met with amongst the aboriginal inhabitants.

Considering the limits of Brazil, it has very few inhabitants. In 1792, they were estimated at about 200,000, the negroes at 600,000, and the native at one to one and a half million. Since this period, however, the population has been on the increase, and recent events will doubtless still further augment the number of the whites. At this time the whole population may be estimated at about three millions.

Nearly every mineral is to be found in Brazil ;

although the natives, from their want of skill, have hitherto derived but very little advantage from the concealed treasures of the soil, with the single exception of their gold, a vein of which runs, it is said, through the whole land at the depth of about twenty-four feet.

However rich the bowels of the earth may be in Brazil, the surface of it is not less so; and when the inhabitants shall give that attention to agriculture which on every account it merits, they will find themselves amply rewarded for their pains.

The trade between Brazil and Europe has received of late great improvement, and is likely to become every day of more consequence: in 1818, there sailed from the port of Bahia, one hundred and forty-eight vessels, of which forty-three belonged to Lisbon and Oporto, ten to Gibraltar, eleven to Hamburgh, five to London, and thirty-six to Liverpool.

In 1820, the exports of British manufacture amounted to 1,860,000*l.*; in 1821, to 2,280,000*l.*; and at this day they are reckoned at 3,000,000*l.* annually. The imports of 1820, were 950,000*l.*; in 1821, they were 1,300,000*l.* The commerce expressly confined to Brazilian vessels is the coasting African trade. The importation of negroes cannot be estimated on an average at less than 21,000 in Rio de Janeiro only, and there are three other

ports trading to the same amount. The price of a new slave is from 25*l.* to 40*l.*, according to the quality ; but a slave possessing the knowledge of any useful trade, will sell for 200*l.*

Foreign iron is strictly prohibited in Minas Geraës.

The commercial treaty between Great Britain and Brazil has just expired.*

The religion of Brazil is Catholic, according to the church of Rome. Six bishoprics have been successively founded, under the archbishopric of Bahia, which see was established in 1552.

Independently of the cities which have been already mentioned, Brazil contains the large towns of Monte Video, St. Paul, Para, Maranhan, and others.

The annual revenue of the crown of Brazil is estimated at about 2,500,000*l.*

The military establishment of Rio, even before the Portuguese court repaired to Brazil, was considered, by those competent to form a judgment on the subject, sufficiently respectable to oppose any hostile attempt in the field. It consisted of two squadrons of cavalry, two regiments of artillery, six of infantry, two battalions of well-trained militia, besides above 200 disciplined free negroes, amounting in the

* Vide Appendix.

whole, to a body of at least 10,000 men, exclusively of a numerous registered but undisciplined population, of whom a great proportion belonged to the city and immediate neighbourhood. Nor did these constitute the sole forces which, on any pressing occasion, the government of Brazil could employ, for the entire aspect of the state is military.—All men between the ages of 16 and 60 must, in every captaincy, be enrolled either as soldiers of the line, as militia men, or as belonging to the body of *Ordenanças*, a species of volunteers; and the two latter classes, if collected, would not amount to less than 30,000 men.

GENERAL IMPROVEMENTS.

Roads.—Of late years, considerable amelioration has taken place in the public highways: several are now constructing to unite the captaincy of Minas Geraës, with the eastern provinces. One road has been opened on the *Mucuri*; another on the *Rio Grande de Belmonte*; a third on the *Ilheos*; and two others are making on the *Espirito Santo*, and on the *Itapemirim* to Minas. One of the most important communications has lately been completed between the mouth of the Rio Doce and Minas Geraës, and the government, in order to promote the same object,

established, in 1819, a company for the purpose of raising a capital to open the navigation of the river; indeed, between Rio Janeiro and the whole of the provinces, the intercourse is now very active. From Minas the exportations of the captaincy travel to the metropolis upon mules, which proceed in caravans of one hundred and upwards, and are divided into troops of seven, managed by one muleteer.

Messengers.—The negroes are employed in this capacity by the various chiefs in Minas Geraës: the men selected for the employment are the most trusty and able-bodied that can be found. Their letters are locked up in a leathern bag, which they buckle round them and never take off, until they deliver its contents. They carry a gun and ammunition with them, to defend themselves, as well as to provide themselves with food. Whenever they halt, they are sure of a kind and friendly reception, for nothing can exceed the cordiality with which the negroes welcome each other. These men are trusted on very important missions, and are despatched to every part of the captaincy. On urgent occasions, some of them have performed journeys with astonishing celerity. It is recorded of one of these messengers, that he travelled seven hundred miles on a mountainous road in sixteen days, though that distance

usually occupies twenty or twenty-one days. The men can all of them undergo great fatigue; they are generally tall and of a spare habit, accustomed to light food, and not unfrequently to long abstinence.

The post-office at Rio Janeiro has extended its connections to every part of Brazil. In the capital, booksellers have established themselves, and gazettes are published both here and at Bahia. These changes, though many of them more immediately affect the metropolis, have, and will continue to have, a considerable influence over the whole country: other improvements, belonging more immediately to the interior, have added to the general prosperity. Forts have been built on the frontiers, and detachments stationed wherever it was thought they would be beneficial. Telegraphs have been erected along the coast. Men eminent for their knowledge have been ordered to the provinces as governors, and a strict charge has been given them to proceed upon the principles adopted in the capital, for the benefit of the state. Finally, a company has been formed, under royal patronage, for improvement in the art of mining, and another for effecting maritime assurances.

CHAP. IV.

SUGGESTIONS TO TRAVELLERS.

PASSPORTS are necessary to all persons who intend travelling in Brazil, and when these contain a special order of the King, it is customary not to countersign them, a custom which is very advantageous to the bearers, because it leaves them at liberty to alter their route according to their own pleasure. If letters of recommendation can be procured, they will be found highly serviceable, particularly to those who travel in Minas Geraës.

An assumed name of consequence will be found useful, and the higher in military rank the more likely it is to be available—to confirm the dignity of the bearer, an old uniform, cockade, &c. will prove effective, sometimes producing food both for master and cattle when no money will procure it.

Equipage.—Whoever is desirous of travelling with comparative safety and comfort, should be provided with good arms, (a brace of pistols, and a fowling-piece,) a hammock, blankets, a stock of tea, sugar, candles, liquors, soap, and salt, two kettles and a drinking-horn, as well as an um-

rella, which can be by no means dispensed with.—Two mules would be necessary for this baggage. If a small tent can be added, the convenience derived from it will amply outweigh the trouble it may occasion. Mules will be found in every respect superior to horses, of which the breed in Brazil is small; the heat, however, arising from the body of the former animal is said to produce, when this beast is too frequently ridden, a painful complaint (*sciatica*), and the traveller would do well, when opportunity permits, to dismount and walk. The shoes best adapted for walking are those made straight, as right and left shoes, when much worn, hurt the feet; they should be strong, and cover well the ankle.* Some persons on a long march are inconvenienced by blisters; they are easily prevented, or, if suffered to arise, easily cured: let the soles of the feet be rubbed at night with spirits into which tallow has been previously dropped; this should be diligently applied with the palm of the hand, when a few hours will disperse the blisters—it may be prudent to submit the ankles and insteps to the same operation. If spirits and tallow, or grease of any description,

* Persons who wear boots will find the skin of the boa constrictor, when tanned, an excellent leather; it is quite impervious to the wet, and is much used by respectable people in Minas Geraes.

cannot be procured, salt and water form a good substitute. In passing rivers, particularly if they are broad, mules swim far better than horses; they are not so soon exhausted, and keep the riders drier, if there be occasion to continue on their backs: in the purchase, however, of these animals, great care should be taken to select those well trained and in good condition, otherwise they will prove a constant source of trouble and vexation. All the muleteers, on meeting people on the road, say *Jesu Christo*, to which the proper answer to be returned is *a Dios*.—If possible, travelling in the rainy season should be avoided, for those only who have experienced the inconvenience of moving at this period can be aware of the disadvantage.

Travellers are not at all times able to command a breakfast or dinner when their appetite most needs a meal: in this case, they will find smoking prevent any unpleasant sense of hunger. The Brazilians, too, are not the cleanest cooks: by wrapping up the meat to be roasted in a piece of raw hide, the gravy will be preserved and the food be kept free from smoke and dirt.

Although water cannot always be had in travelling, yet in Brazil it is generally to be found: should the former case however arise, *water melons* are a good substitute for allaying thirst, besides being a safe mode of relief; if they are

not to be met with, a pebble kept in the mouth will produce considerable moisture. Whenever a traveller is in distress for water and has sufficient time, he cannot do better than to follow the first cattle-path, as it usually leads to the nearest pool in a direct line. The paths are easily distinguished, being very narrow and the wood uniting above, leaving open below only a shady walk of the height of the animals which made it.

An European will not invariably find to his taste the inn which may present itself, if at all, to his view in the evening; he will perhaps prefer the open air and the heavens for his canopy: in this case, he has no occasion to apprehend any evil effects from his choice, for many travellers have followed this mode and have nowise suffered by it. The dew is trifling and a high wind is usual at night. Whenever a *bivouac* is determined upon near a pool, the highest ground is preferable for the station. Should mosquitos be numerous, a fire must be kindled, and, if possible, of the dried ordure of cattle, of which the smoke is so thick and pungent as entirely to prevent any annoyance from insects; the leeward side of the fire, although not the most agreeable, is of course, in this respect, the most effectual. Independently of vermin, fire will keep off *ounces*, and all other beasts of prey;

there is but one noxious animal drawn by the blaze, the *çurucucú* snake, but the creature is always so intent on gazing at the flame, that it is easily perceived and destroyed, should it make its appearance.

Whenever a bath can be procured, it is strongly recommended to travellers: there is nothing which refreshes and revives from great fatigue so soon. In Brazil, the custom is universal to wash the feet previously to retiring to rest; amongst other good effects of which fashion, is that of preserving the followers of it from the bad results, which to the slothful often arise, from insects.

It is usual for travellers, on entering any captaincy, to exchange their metallic money, and to receive for it the paper of the province, which, on their quitting, they may again exchange at any of the Registers for the *bilhetes* or notes of the district they intend going to.

I shall terminate this chapter by strongly urging every person who may have occasion to visit Brazil, whether for commercial purposes or for pleasure, to respect the national preventions, and most especially the religious opinions, of those with whom he may mingle. It is of the utmost importance to the prosperity and security of the many great undertakings, which now occupy so large a share of the public attention, that no

slight be shown to the political institutions, nor to the creed which the South Americans profess, by the officers and servants who may be sent amongst them by the several trading bodies of Britain. The Protestant opinions of Englishmen are sufficiently obnoxious, without being called into notice by any injudicious, absurd, and fruitless attempts at conversion. If the utility and policy of agitating such a source of discord where we are undisputed masters, as amongst the Hindoos, for example, may be questioned, I presume, it will be admitted, by all but fanatics, that it would be little short of insanity to do it in a country where our establishments will stand in need of the countenance and protection of every class of citizens. I press this subject the more warmly, both because it is of immense importance, and that I have had but too frequent occasion to observe the hatred which many of my countrymen have created against themselves, in the breasts of strangers, by their never-ceasing interference in matters which nowise concern them, and in some of which, above others, the jealousy of foreigners is the soonest roused, and their passions the quickest kindled.

CHAP. V.

NATURAL HISTORY.

BEASTS of prey in America are not so fierce as in Africa and Asia: they seldom attack the human species, but when forced by hunger or purposely provoked.

The *Lion* in Brazil is the least dangerous of the ferocious race; his chief prey is on the young cattle.

The *Tiger* will generally steal away from a man, particularly if he is mounted. Hence, little danger is to be apprehended from this animal, by any person travelling on horseback, unless he should inadvertently approach the haunt of a female with young. The Indians have discovered a certain method of driving away tigers as they are very light and nimble: the minute they espy one making towards them, if they have nothing to defend themselves with, they hurry up into a tree. The animal, unable to pursue his prey, surveys them with greedy eyes from the bottom of their asylum, and would there remain, it is probable, long enough to oblige them to surrender at discretion, or let

themselves fall to the ground through weakness, had it not been happily found out, that this creature cannot bear the smell of human urine. The Indians take advantage of this, and the tiger immediately flies to a sufficient distance to give them an opportunity of making their escape. Those among the Indians who make use of firelocks are still less at a loss on these occasions, for they have often been seen to shoot tigers dead while springing at them.

Negroes and Mulattos will often lay snares for tigers; nay, will, for the slightest reward, go in search of and encounter them in single combat.

The weapons on this occasion made use of are only a lance and a kind of cimeter. Thus provided, they stay till the creature makes an assault on the left arm, which is wrapped up in a short cloak of baize. Sometimes the tiger, aware of the danger, would willingly decline the fight, but his antagonist provokes him with a slight touch, in order, while he is defending himself, to inflict a sure blow; for, as soon as the animal feels the spear, he grasps it with one of his paws, and with the other strikes at the arm which holds it; then it is that the person quickly aims a stroke with his sword, which he takes care until this instant to conceal, and, hamstringing the enemy, obliges him,

foaming with anguish and rage, to retire. The retreat, however, is but of short duration ; revenge is sweet even to the tiger, and he bounds to enjoy it before he yields the last breath : the wily Indian calmly awaits the second attack, when, repeating the deadly wound, he at once lays prostrate his foe, and kills him afterwards at his leisure.

The *Ounee* is another formidable beast : he is nevertheless often pursued by man. When an ounce has been seen prowling about any place, the news is soon proclaimed among the neighbours, two or three of whom take muskets loaded with heavy slugs, and go out with the dogs in quest of the enemy, who generally lurks in a thicket near some carcass, and diffusing withal so strong a scent, that the dogs quickly find him. When disturbed, he retreats to his den, if he has one, the dogs never attempting to fasten on, or even face him, but on the contrary, endeavouring to get out of his way, which is not difficult, as he is heavy and slow of motion : should he cave, the entrance to the hole is closed and the sport is at an end, but he more commonly has recourse to a large tree, which he climbs with great facility ; here his fate is generally decided, for the hunters get near enough to take a steady aim, and seldom fail to bring him down, one of them reserving his

fire to despatch him, if required, after he has fallen.

American wolves (*lupus Mexicanus*) are frequently found in Minas Geraës.

Snakes.—This is a numerous race: they live chiefly in the forests, under stones or rotten wood, and in dark and low swampy tracts. It is not, however, often that they bite any one, unless from inadvertency or design he has been the aggressor. Besides, they are so far from having an extraordinary agility, that they are remarkably torpid; so that, were it not for their motion in retiring to hide themselves among the leaves, it would be often difficult to determine whether they were dead or alive. The snakes most common are the coral, the rattle, and the *Sucuriu*, or boa-constrictor. The first is of such shining colours, that it may be seen at a great distance. The second, which is numerous in Minas Geraës, where it frequents the high and dry parts, announces itself by the rattle. It has, moreover, for an antagonist in the open parts of the country, a bird about the size of a bustard, which seizes it with impunity, mounts aloft and suffers its prey to drop, then, plunging, retakes it before the creature reaches the ground, again mounts and repeats the process until the victim is deprived of life. Antidotes are everywhere to be found against the

poison of the rattle-snake: the most successful are a stone to which has been given the name of St. Paul, bezoard, and a poultice of chewed garlic. The very head of the reptile and its liver, which is likewise eaten to purify the blood, are equally efficacious. The surest method, however, is to begin by making an incision directly in the part that has been stung, and then apply brimstone to it; although this drug alone has been often found to make a perfect cure. The boa-constrictor, in the inhabited portion of Brazil, is mostly discovered and destroyed when young, but in the less frequented parts of the country it arrives at an enormous size. These monsters are often found with their tails entwined around trees, whence they dart on their prey. Men have sometimes been caught by them; but, if a person so situated can draw his knife, his escape is very possible, though he will receive several wounds. The remedies applicable to their sting are best known by the negroes; one is the *habilla*. This bean grows on the *bejucos* plant in the forests, especially near Carthagena in Colombia; it is known in several parts of America, but everywhere by the name of *habilla de Carthagena*.

The few surgeons in the interior of Brazil almost entirely decline prescribing for the bite

of serpents, and rather leave it to people called *curadores*.^o When the venom instilled be very deadly, these persons cut out the wounded flesh, or burn it by means of red-hot iron : if the venom be not very powerful, the curador generally begins by sucking the part injured, causing the patient to be conveyed into a dark chamber, carefully guarded against every draught of air, and administering to him internally a great quantity of decoctions of certain herbs, besides applying poultices of the same medicine outwardly. Amongst other commonly used remedies, are the leaves and roots of the *Raiz preta*, or *de Cobra* ;* also of the *Loco*, which draws blisters, the *Picão*, the *Erva de S. Anna*, and the *Spilanthes Brasilienses*. Persons who have been bitten by very venomous serpents, and preserved from death, ever remain extremely weak, and are troubled with swelled and ulcerated legs.

* The bruised herb, moistened with oil, is said to effect a crisis by promotion of urine. See on this subject Gomez, in the Memoirs of the Royal Academy of Lisbon, 1812, 11, p. 23, where the plant is described as *eupatorium crenatum* ; the family of the Compositæ has many species, which seem to act as specifics against the bite of serpents, and it deserves, on that account, to be more accurately examined. There is also another plant, *ayapana*, which is considered a powerful antidote against the bite of serpents, and which is to be laid on the scarified wound.

Scorpions are dangerous: they breed in corners of houses, closets, &c. The sting of some is less noxious than of others: that of the black is reckoned the most malignant, though timely care prevents its being fatal. The stings of the other kinds produce fevers, numbnesses in the hands and feet, forehead, ears, nose, and lips; tumours on the tongue, and dimness of sight. These disorders last generally twenty-four or forty-eight hours, when, by degrees, the patient recovers.

Centipedes.—The bite of centipedes is likewise dangerous, without timely application is used; nor is the sufferer free from torture till the medicine has destroyed the malignity of the poison.—Common salt is a specific against the bite of centipedes and scorpions; and persons stung by the latter are prevented from drinking water, which brings on convulsions. When scorpions and centipedes are large, the head is the best part to strike, in order to destroy them.

Bats are very numerous, and care must be taken at night, to cover the person against their attacks. The Vampire Bat will settle, as it is said, on any limb which may be bare, and literally gorge in blood, fanning the sleeper all the while, so as to prevent his awaking.

Musquitos.—Strangers particularly feel the

tormenting consequences of musquitos, which attack them for some time after their arrival in Brazil: a protracted residence, however, brings about some alteration in the body, which guards it against these insects; not that the skin ceases to be sensible of their sting, but either it is no longer liable to be penetrated by them, or it discontinues to afford juices attractive of their taste. Musquitos do not bite with such disagreeable effect in airy situations: lime juice, however, will counteract their sting.

Marimbondos are venomous wasps, or hornets, found near boggy ground. Their sting causes a swelling, attended with severe pain, though not dangerous, nor of long duration.

Ants are particularly fond of sweetmeats and sugar. There is no method of keeping them from articles of this description, but that of setting the feet of the tables in large dishes of water, or smearing them with tar.* The Termites, or White Ant, so destructive in the East

* The Abbé Raynal, in speaking of ants in Guiana, says, "At present the greater part of the plantations are overrun by them, and many, to such a degree, as sometimes to baffle the greatest hopes of success; but this is an evil that every new settlement in America has experienced, and which, in time, they have been freed from. Many do not now suffer any inconvenience from it: the rest but little. Guiana will be less subject to it in proportion as the lands are cleared."

ludies, is not less so in South America. The mode used to destroy them is rather singular; that of turning the antipathy of the race to good account. As soon as they are observed, a little sugar is put down, which, in a moment, summons a tribe of brown or black ants, who instantly attack and destroy the termites. An idea prevails, that every white ant's nest is frequented by a toad, a seriema, and a snake; the first to eat the ants, and afterwards to be devoured by the snake.

Carapato, or Tick.—There are two kinds of this vermin; the first sort is venomous, the other not: the latter causes no pain but what is usual to the case. The former, in its effects, is extraordinary: the insect is very small, and of a dark brown colour; it fastens upon the skin, into which it will, in time, eat its way. When lodged at the extremity of the toes, it violently inflames the glands of the groin, and the pain continues, without relaxation, till the animal is extracted. If fixed, it is dangerous to pull it out quickly; for should the head only remain, the evil continues unabated. The point of a heated fork, or penknife, applied when the tick is too far advanced into the skin to be taken out by the hand, will best succeed in loosening it; and after it is extracted, either snuff, tobacco-water, or *unguentum basilicum*, which

is sold by the apothecaries in Brazil, should be rubbed into the puncture.

Jigger, or Sand-Flea.—This vermin is oftentimes very troublesome. It conceals itself under the toe-nails, requires great attention, and the streets of Rio show every day examples of its victims to a disregard of its attacks, which often extend to the legs and arms. The negro race seem more conversant with, and are generally employed to extirpate, this insect.

Frogs.—No stranger can have an idea of their number, found on the marshy grounds; nor the noise which they make. It is a common diversion, when they issue from their lurking-quarters, for the inhabitants, at night, to procure a forked stick, with sharp points, and to strike it in the earth, without any very particular selection of place, until the forked part is full of them, when they are stripped off, and the operation recommenced: thus many hundreds are killed in a very short time.*

Spiders.—Among them there is one of a re-

* I know not whether the Brazilians are yet sufficiently well versed in the gastronomic art, to turn their frogs to account. On the continent of Europe, and in France particularly, they are reckoned a dainty. Most of my readers are, I presume, aware that the hind legs only of the frog are all of it that is cooked.

markable full size, found in the cavities of large trees, which, if disturbed, inflicts a wound so small as to be scarcely visible, but which produces a bluish swelling, painful, and, in some instances, said to occasion death.

Ostriches—Are sometimes kept in the house for the purpose of catching flies and other insects, and follow their vocation with the most persevering and successful earnestness. Domestic fowls will devour ants and scorpions: they will also attack centipedes.

Coya.—This insect generally inhabits valleys. It is shaped like a spider, but is much less than a bug, and is usually found in the corners of walls, and amongst herbage. Its venom is very great, and causes swellings and tumours. One remedy is, to singe the person all over the body with the flame of straw, or long grass. In order to do this, the Indians lay hold of the patient, some by the feet, and others by the hands; and with great dexterity perform the operation, after which the person is reckoned out of danger. Oil and salt form another remedy, which is considered equally efficacious. People who travel along the valleys, when they are in danger of these coyas, according to the warning before given them by the Indians who attend them, though they feel something stinging, or crawling on their neck or face, are careful not to

scratch the part, nor even so much as lift up their hands to it, the coya being of such a delicate texture, that it would immediately burst ; and, as there is no danger whilst they do not eject the humour in them, the person acquaints some one of the company with what he feels, and points to the place. If it be a coya, the other blows it away.

Caymans, or *Alligators*, are not known to go far from the banks of the rivers. When out of the water, they appear like logs of half-rotten wood. Whatever may have been written with regard to the fierceness and rapacity of this animal, it is found, from experience, that they avoid a man ; and, on the approach of any one, will immediately plunge into the water. Their whole body is covered with scales, impenetrable to a musket-ball, unless it happens to hit them in the belly, near the fore legs, the only part vulnerable. The alligators, when pressed by hunger, seek for food at night, in the meadows. The inhabitants of those spots where they abound are very industrious in catching and destroying them. Their usual method is by a casonate, or piece of hard wood, sharpened at both ends, and baited with the lungs of some animal. The alligators, on seeing the lungs floating on the water, snap at the prize, and thus both points of the wood enter the jaws in

such a manner, that he can neither shut nor open his mouth. The more he endeavours to get rid of it, the deeper it enters ; so that the distension makes way for a great deal of water, and the monster is suffocated. He is then dragged on shore, by means of the rope to which the stick is fastened ; when, if he still has any life in him, he violently endeavours afresh to rescue himself, whilst the Indians bait him like a bull knowing that the greatest damage he can do is to throw down such of them as, for want of care or agility, do not keep out of his reach.

CHAP. VI.

MEDICAL HINTS FOR EUROPEANS MIGRATING
TO BRAZIL.

It is not my intention, by the following remarks, to supersede the necessity of medical assistance, which should be early resorted to on every urgent occasion; but merely to offer a few hints, by an attention to which individuals emigrating to Brazil, or other tropical climates, may be enabled to ward off the attacks of disease; or, should they be assailed by them, to diminish their influence and fatality. It is extremely proper, as a matter of precaution, on approaching warm latitudes, especially when the habit is plethoric or robust, to lower the system by the occasional use of a mild cathartic; and by losing ten or twelve ounces of blood, more or less, according to circumstances. After bleeding, if the individual be of a bilious temperament, a gentle emetic, of ipecacuanha, will frequently be found useful. In every climate temperance may justly be regarded as the parent of health; but Europeans, and the English in particular, too generally vilify tro-

pical climates, because they cannot indulge, with impunity, in that free mode of living to which they had habituated themselves in their own country. The utility of moderation is strikingly illustrated by the greater aptitude of the English, to disease of every kind, than the French, whose mode of life, when compared with that of the former, is regular in an uncommon degree.

The diet of Europeans, on their first arrival, should consist, in a great measure, of vegetable food; and they ought to be particularly careful to avoid such articles as are of a heating or stimulant nature. Yet, so powerful is the effect of habit, that they not only continue the use of animal food, but indulge in inebriating liquors to the same excess as they had been accustomed to do in their own temperate climate.

It cannot, therefore, be too seriously inculcated on the minds of those individuals thus circumstanced, that if they would content themselves with a moderate use of wine, and confine themselves to fruits and vegetables, like the natives, they might rely almost to a certainty on escaping the attack of fevers, and numerous other diseases, to which, by not adopting their mode of living to their new situation, they frequently fall victims. Self-command in

the indulgence of sensual gratifications is also a circumstance of great importance towards the preservation of health, as well as a strict attention to avoid a current of air, or moisture, particularly when the body is heated by exercise.

The habit of retiring to rest at an early hour, and rising betimes in the morning, is extremely favourable to health in warm climates, as well as cold bathing; after which, gentle exercise, either on horseback or on foot, will prove particularly salutary, and render the body less susceptible of external impressions.

Dancing is an amusement which ought to be carefully avoided by strangers on their first arrival in tropical regions.

The regulation of the bowels is likewise an object of importance, and, with this view, mild gentle laxatives ought to be taken occasionally.

The dress of new settlers ought to consist of thin woollen or cotton clothes, or other washing materials. For the under garments, calico is preferable to linen, as this last substance, when moistened with perspiration, is apt to convey a sense of chillness over the whole frame. They ought also to be particularly careful to change these garments after being wetted with rain, or after having perspired profusely.

It is well known that swamps and marshes, when acted on by the heat of the sun, exhale

noxious effluvia, which prove a prolific source of intermittent and remittent fevers, especially to Europeans lately arrived. Those who are obliged, by business, to remain in such situations during the day, ought at least, if possible, to retire in the evening to a more elevated part of the neighbourhood. When, however, circumstances render this impossible, such precautions should be adopted as will tend, in some measure, to lessen the danger to which they are unavoidably exposed. With this view, an upper apartment should be chosen as a bed-chamber; and those windows fronting the low ground, where the house is to the leeward, kept shut, while those on the opposite side may be suffered to remain open, to admit of a free ventilation.

By an attention to these few hints, experience and observation warrant the affirmation, Europeans and new settlers would, for the most part, escape those maladies to which, merely through want of precaution, they so frequently fall victims.

DISEASES MORE PECULIAR TO MINAS GERAES.

Leprosy, of a peculiar kind (Mal. de S. Lazaro), which is found in all parts of the province, as is *Syphilis*.

Catarrah and *Rheumatism*—the former attended with fever.

Inflammations, particularly of the throat and lungs.

Cholic and *Acute Rheumatism*.

Elephantiasis, to which the negroes are particularly subject.

Psora, which sometimes prevail among the lower orders, who rarely use any remedy against it; nor will they hear of sulphur, as they believe it to be fatal.

Sciatica.—I have mentioned this complaint, as attacking those who have occasion much to be on muleback. When not attended to, it causes in the loins almost constant excruciating pains, which frequently become chronic, and sometimes incurable. Mr. Mawe relates, that being, on his return from the diamond district, much tormented with sciatica, he was led to make inquiries on the subject, and was informed, that a person in the house where he then resided had returned from a long journey in the same predicament, and was about to undergo the mode of cure, commonly practised in the country. Mr. Mawe, being desirous of inquiring the nature of it, begged to be introduced to the sick man. On conversing with him, he found that his symptoms were similar to his own. He complained of great pain in the

os sacrum, and down the left thigh to the knee, which afflicted him most when in bed, where he could not bear to lie in any posture for half an hour together, but was obliged to rise and wait until the warmth was abated, when he lay down again. Thus he could get no sleep night or day. On asking if he had tried any external application as a stimulus, he replied, that neither that nor any other remedy was of the smallest avail, except the one peculiar to the country, which is as follows:—the patient lies down on a bench, with his back upwards, and a youth, twelve or fourteen years of age, kneels upon his loins, and continues to trample them (as it were) with his knees, for about the space of half an hour, until the muscles are entirely bruised. In a few hours afterwards, the parts become highly discoloured. If one operation has not the desired effect, another, and even a third, is had recourse to. It must be confessed, that this remedy, in removing an evil, occasions another, but the advantage is, that the latter is of short duration; whereas the former endures sometimes for life, and gives continual affliction. In some cases, the remedy has been applied with success, but in others it has entirely failed.

Goitre, or, as it is called in Minas Geraës, *pupas*, prevails almost universally, afflicting peo-

ple of all classes and all colours ; even the cattle do not escape. It has been ascribed to the coldness of the waters, to the mineral and vegetable impregnations which they contain, although these are conjectures. On a very large estate near Sabara, it prevailed so much, both among the family and the cattle, that the owner was induced to dispose of the place. The purchaser observing that one side of it was bounded by a river, which flowed through thick native forests, and attributing the evil, as is generally done, to the water, he caused a broad trench to be dug across the ground, so as to compel the cattle to seek their beverage from some springs, which he opened and nurtured, and ordered the same spring water to be used in his house. No goitre has appeared upon the estate since, though he has been in possession of it several years. In another case, where the patient was servant to a military officer from St. John, a different remedy was effectual. This man attended his master to Rio, who took a house about two miles from the city ; whence the slave had to go every morning to market, and, because sea views were new to him, he generally chose to walk along the beach. Thinking the taste of sea water not unpleasant, he occasionally took some of it. The goitre was soon observed to be softer, and sensibly

less; and in the space of two months entirely disappeared. It was natural that the cure should be attributed to the saline particles of the water, and in similar cases both salt water and common salt have been recommended; although, in the instance related, it is proper to add, that the cure was followed by another unpleasant complaint, which, however, possibly might arise from other causes. There certainly also are salt-eaters who are affected with the goitre, yet it is a fact speaking strongly in favour of the remedy, that in the whole interior of South America, salt is an article of extraordinary luxury; for want of it European cattle languish and die: and it is wonderful to see how oxen and mules will lick and gnaw the ground of the rancho where a cargo of salt has been laid down only for a single night. Rich people also, who have the means of procuring such a luxury, it is observed, are less subject to the complaint than poor ones. The disease, too, prevails much in all mountainous countries, such as the Alps, where there is least salt in the soil, and whither little is transplanted from the plains.

CHAP. VII.

PARTICULAR GEOGRAPHY.

MINAS GERAES.

THIS great captaincy was formerly included in that of St. Paulo, from which it was separated in 1720. Its extreme length from N. to S. is about six hundred miles, extending from latitude 13° to $21^{\circ} 10'$ south. Its width is about three hundred and fifty miles; the Serra Mantiqueira divides it from the provinces of Rio and St. Paulo, on the south; on the north, it is separated from Bahia and Pernambuco, by the rivers Verde and Carynhenha; on the east, it is bounded by part of the captaincies of Bahia, Porto, Seguro, and Espiritu Santo; and the west, by Goyaz.

Climate.—The seasons are not very distinctly marked; the trees are not stript of their leaves, by the moderate cold of June and July;* and, in August, they present only a faint appearance of spring, by putting forth young foliage and flowers. A short winter of two months com-

* Some years, towards the southern parts, water, if exposed to the night air in vessels, congeals during these months.

mences towards the latter end of May, when the average temperature in ordinary years is 50°, of Fahrenheit's thermometer; in the hot season, the glass rarely or never rises above 80: the more marked distinction of the year is into wet and dry seasons, the former continuing from October till May. The rain, especially at its commencement, is accompanied with frequent and tremendous thunder-storms. They come on suddenly, and, having spent their force, leave the sky as clear and as serene as they found it, with a freshness which is felt by the inhabitants in every pulse. The rain is heavy while it lasts, which is sometimes for days, and even weeks. The greatest weight of water falls in November and December: in January there is an interval of fine weather, which is called *veranico*, or the little summer; and in February and March, the rains become less frequent, till they cease. The north wind comes on constantly with the wet season, and the east with the dry. The latter brings with it cold and fog, which go on increasing till the winter months. On the whole, however, the climate of Minas Geraës may be pronounced extremely healthy.

Rivers.—In no province of Brazil are the rivers so numerous as in Minas Geraës. The principal are the Jequitinhonha, the Rio Grande.

the Francisco, and the Doce: the latter has four remarkable falls, and should the company which has been mentioned venture on the expense, they would render it the most important, and certainly the best medium of transit, for the produce of the richest districts of the captaincy. As yet, little use has been made of these great natural advantages; and, although portage would be necessary in some places upon most of the rivers, still there are very few of them which would not admit of a most active intercourse being carried on.

Forests.—Minas Geraës cannot be said to abound in wood. Several of the mountains are bare at their summits, or at most are covered but with dwarf shrubs. At their base, however, and on the plains, as in the valleys, some extensive forests present themselves to the travellers view, of which a few have still to be explored.

Minas Geraës is divided into five *Comarcas*, or districts: namely, Villa Rica,—one hundred and forty miles from E. to W., and one hundred and twenty miles from N. to S.

Rio das Mortes,—to the south, one hundred and seventy square miles.

Serro do Frio,—three hundred miles from N. to S., and one hundred and eighty miles from E. to W.

Sabara and Paracatu,—to the west, three hundred and fifty miles from N. to S., and more than two hundred and ten from E. to W.

The principal towns are—

Villa Rica, capital of the Comarca of that name, and of the Capitania, sixty-six leagues N.N.W. of the Rio, has a population of about nine thousand persons of whom there are more whites than blacks. The town carries on a considerable trade, several roads branching from it to different parts of the country; almost every week large convoys set out with the productions of the captaincy for the capital of Brazil, and bring back goods in return. The markets of Villa Rica are not very well supplied.

Pulse and vegetables for the table are scarce. Grass is an article in great demand, mules requiring at least sixpence worth of it every day, exclusive of their corn.* Milk is as dear as in London. Poultry is from three shillings and sixpence to four shillings and sixpence per couple. Beef is three-halfpence per pound, but is not good. Pork is very fine: Mutton is utterly unknown. Tallow is exceedingly dear, and candles are more

The soft grass (*capim mellado*), which is common in Minas Geraës, and is a favourite food of the horses and mules, on account of its tenderness, and the oily down which covers it, makes them short-winded, if taken for too great a length of time.

than double the price they sell at in England.*

The Governor of Minas Geraës resides at Villa Rica, as well as a Vicar-General and Professors; an English Medical Practitioner has recently fixed his abode in the city. Amongst the public establishments is an hospital and a smelting-house, the latter employing sixteen persons. Here all the metal found in the Comarca must be brought, for the purpose of being smelted, and paying the duty levied upon the gross weight.

Marianna,—eight miles E. N. E. of Villa Rica, upon the same river. It is an episcopate, with a population of between four and five thousand souls.

St. Joan d'El Rey.—Capital of the Comarca of *Rio das Mortes*, eighty miles S. W. of Villa Rica, about the same distance S. S. W. from Sabara, and upwards of two hundred N. W. of Rio de Janeiro. The trade of this town is on the increase, and the inhabitants have frequent communication with the capital. All the necessaries of life abound in this place, and provisions are much cheaper than at Villa Rica. Pork and beef are about one penny per pound; poultry is in proportion; vegetables are quite as

* These were the prices in 1808.

reasonable. Amongst the public establishments is a smelting-house, with the same appointments as at Villa Rica, excepting the *Abridor dos Cunhos*, or engraver of coins.

Villa do Principe, capital of the Comarca of *Serro do Frio*, one hundred miles N. E. of Sabara; one hundred and ten N. N. E. of Marianna, and three hundred and seventy N. W. of Rio de Janeiro. The town has a smelting-house for gold. Its inhabitants are chiefly miners.

Villa Real do Sabara, capital of the Comarca of that name, thirty-five miles N. N. W. of Marianna, seventy N. E. of Tamandua, near one hundred S. W. of Villa do Principe, and seventy-five N. N. E. of St. Joan d' El Rey. It has, amongst other establishments, a smelting-house for gold, the expenses of which are forty thousand crusadoes annually, having the same appointments as that of Villa Rica, with the exception of the engraver of stamps for coining, and the third founder. In 1788, the population of Sabara was seven thousand six hundred and fifty-six persons; in 1819, it did not exceed nine thousand three hundred and forty-seven.

Paraçatu do Principe, capital of the Comarca of the same name. This was made a separate district, and taken from that of Sabara, in 1815.

It is one hundred and forty miles from the Rio S. Francisco, and about half a mile from the Corrego Rico, which falls into the Paracatu. The inhabitants of this place were, in 1808, about one thousand souls.

Population.—The population of Minas has been differently estimated. In 1776 the province contained about 319,769 individuals; in 1813, they were computed at 480,000; at the present time it is generally considered that 600,000 must be the number of residents; the negroes appearing in the proportion of two to one to the whites; the mulattos in the proportion of three to two to the whites, and of three to four to the blacks. The Indians are estimated at no more than nine thousand.

Civil Government.—The province of Minas Geraës is under a captain-general, who is appointed for three years; at the end of which period, the same person is continued, or not, at the option of the emperor. The captain-general has the sole command of the military force; he is in fact, for the time being, absolute. Civil and criminal causes are discussed before, and determined by the *Ouvidor*, who holds other posts, serving also as crown judge, and the *Juiz de Fora*, who is likewise attorney-general: the former, however, is the superior in rank. These individuals too are appointed for three

years, which term may equally be renewed or not, at the pleasure of the crown.

Military Force.—The regular military establishment of the capitania is very respectable, and consists of fourteen hundred cavalry, which number is prescribed by law. Their principal station is at Villa Rica, where the general resides. They form a disposable force for the service of the province, which they seldom quit, except when they escort treasure to the capital. Independently of troops of the line, each township has a body of militia, as well as *Ordenanças*. The first are commanded by the usual number of officers. The last have for their immediate chiefs, the *Capitains Mores*, who serve without any pay, and enjoy considerable influence in their respective neighbourhoods.

Trade.—The first settlers in Minas Geraës devoted themselves wholly to the search after gold; at the present day, the inhabitants perceive the folly, with their limited means and knowledge, of this pursuit, and they are betaking themselves to agriculture, for which a great part of their territory is peculiarly well suited. Maize, for instance, bears in the first year four hundred fold; a harvest of two hundred fold is but moderate, and one hundred fold is looked upon as decidedly bad. Whatever once may have been the case, there are now few families in the

captaincy which can be called opulent; perhaps, scarcely half a dozen in this vast province who possess a capital of 20,000*l.*, or three hundred slaves.

Character.—It would be worse than useless to attempt the delineation of a character which as yet must be very imperfectly known. A few facts, nevertheless, which will partially show the lights and shades of the inhabitants of Brazil, may not be unacceptable.

“Soon after my arrival in South America,” says that intelligent traveller Mr. Luccock, “I was shooting in the woods alone, where I encountered three most suspicious looking men, whom I in vain strove to leave. They made many attempts to induce me to discharge my gun, which I determined to avoid if possible, while in their company: indeed, I thought the gun was the principal object of their wishes. Coming to a small run of water, I laid my hat on the bank, and requested one of them to hold the gun while I quenched my thirst. They seemed astonished at my confidence, spoke with each other in a low tone of voice, and, when I had drank, the man returned my gun with much natural politeness, and bade me farewell. Had I laid down the piece together with my hat, I have little doubt that they would have made off with both. But what-

soever is committed in trust to a Brazilian peasant is sacred, and bad men are not unfrequently the most superstitious."

At *Engaitado*, observes our traveller, "I practised a stratagem which appears to me an useful one in half-barbarous regions. It was my uniform custom to carry concealed about my person a brace of bayoneted pistols, and never to be a moment unarmed. Besides these, I had other pistols fixed on my saddle; on arriving at a station, my first business was to form some notion of the character of the people, while a servant was stripping the horses. If the opinion proved unfavourable, I have delivered my holsters to the master of the house, desiring him to take good care of them, as the pistols were loaded; and, in consequence of such seeming confidence, have seen an immediate change in the most villainous-looking features, and converted a rascal, as I imagined, into a zealous guardian. The man who meditates ill is always jealous of his own safety and suspicious of strangers, especially when he sees them armed. By giving up your weapons, he unexpectedly becomes possessed of the fullest proof of your confidence and good will towards him. The favourable impression upon his mind will last longer than a single night, unless some powerful cause operate upon his passions; and

no traveller in his senses would first take pains to sooth a wild animal, and then rouse him in sport or heedlessness. Well knowing, that there are some among the keepers of houses of public entertainment in the country, who are anxious for the safety of their guests, and would defend them at any risk, I would by no means mislead any one into the belief that the whole class is savage and villanous. But there are many such characters, and among them a stranger is destined to spend some of his most unguarded hours."

When Mr. Luccock was at St. John d' El Rey, in 1817, he witnessed the departure of a troop of fifty mules for Rio, many of which carried bars of gold. The burdens were frequently as large as a female slave could conveniently hold in her arms; and, although the slave herself, and every one she met, were perfectly aware of their value, they were generally loosely tied up in cotton bags, and carried about with little care or suspicion.

VALUE OF PROPERTY.

At *Conceição*, the rent of a tolerable house is about two shillings per month. In 1725, the mine of the Padre Antonio Freitos, situate at *Con-*

gonhas de Sabara, was bought for 150,000 crusados. Part of the country arround *Villa Rica* seems to be let out on an annual rent, to persons who wish to employ their capital in mining adventures. In 1808, houses were to be purchased at *Villa Rica* for half their original cost: thus, a building of which the prime cost was 1000*l.*, might be obtained for 500*l.*; and even at this reduction buyers were scarce, as a further deterioration was expected.

1817.—About two miles from *St. Joan d'El Rey*, near *Matazinhos*, finely situated in a deep valley, by the side of a small but limpid stream, is a spacious and excellent house, possessing all the suitable offices for the accommodation of a large family. The soil is extremely good, but in no part cultivated, except a small garden, where plants of every description flourish in wild confusion. Below are found tanks and fish-ponds, and every convenience for watering and feeding cattle. On this estate are the ruins of a large gold mill. The farm, with these, is to be sold, or, if more convenient to the occupier, to be let. It contains a quarter of a league in *testado*, or breadth: the length is undefined; but, when speaking of it, the owner says, “you may go as distant as you please; I know of no one beyond, who has any claim.” The whole, as far as can be judged of such a tract, appears to be a rich

red loamy clay, probably dry and hard in summer, and destitute of wood, except such fruit trees as grow and flourish in the garden. The price asked for this estate is 1200 milreis, or 300*l.* sterling, which includes every expense of purchase, decima or tax on the sale, and the charges of making out the title.

CHAP. VIII.

GEOLOGY.

THE materials of which the general mass of the earth is composed are variously distributed in different parts, some being found placed in a regular manner, and others irregularly. More commonly the strata are arranged in a direction inclining to the horizon, when they are said to *dip*.

When the strata are separated, and the fissures are filled up by a mass of mineral or metallic matters, they form what is called a *vein*, and these veins sometimes branch between the strata in various directions.

When the edges of the strata on each side of a fissure are divided and disarranged, they are said by the miners to *trap*.

If the country in which the strata lie runs in a waving direction of hill and dale, the strata usually preserve the same waving direction, keeping pretty nearly parallel to each other.

Granite—Is found in the lowest and the highest situations of the earth that have yet been

examined. It forms the basis of all the other strata, and is composed of quartz, feldspar, and mica. Granite is by no means abundant in metallic and the richer mineral substances; it however contains considerable varieties, some of which have as yet been found in no other substance.

Gneiss—Is not unfrequently confounded with granite, from which it differs rather in the arrangement than in the nature of its component parts, which in gneiss are arranged in schistose, or slaty form, whereas, in granite, they are in distinct grains or crystals. Several metallic ores are found in gneiss, and not unfrequently silver ores.

Micaceous Schistùs,—otherwise called *Schistose Mica* and *Mica Slate*, is composed of the same materials as granite and gneiss, except that it contains little or no feldspar; the quartz and mica being arranged as in gneiss. Metallic ores are also found in it.

Quartz—Is not unfrequently found distinct from feldspar and mica, and sometimes whole mountains are composed of it.

Argillaceous Schistùs,—especially the softer variety, is remarkably rich in metals; it forms the greater part of Potosi, one of the richest silver mines.

Hornblende and *Hornblende Slate*—Is some-

times found existing separately from the compounds on which it usually occurs : it contains metallic substances.

Serpentine—Is a stone of a similar nature, with respect to its ingredients, with those already described : metals are seldom found in it, except iron.

Porphyry—Generally consists of the same materials as granite, but in different proportions ; it is found in the greatest abundance between the tropics, especially in South America. There are several varieties, of which two are rich in metallic ores.

Syenite—Is essentially composed of feldspar and hornblende ; metallic veins are not unfrequently found in it.

Primitive, or Granular Limestone—Is sometimes scaly or lamellar ; at others, nearly compact ; and is now and then found to have a splintery fracture : it often contains veins of metallic ore.

Primitive Trap.—Under the general description, Werner comprehends four stony substances, hornblende and hornblende slate, primitive greenstone, and schistose greenstone ; primitive trap frequently contains metals.

SECONDARY COMPOUNDS.

THE substances now to be noticed are distinguished from the preceding, in containing more or less the remains of organized beings.

Secondary Limestone.—Is very abundant in most parts of the world; it often contains metallic veins.

Gray Wacke.—This species of stone is rich in metals; in Transylvania, in Voerspath, it contains mines of gold.

Secondary Trap.—There are several varieties, of which some contain metallic ores.

Sandstone, or Grit.—There are two principal argillaceous sandstone and siliceous sandstone; the first is not very abundant in metals.

Gypsum, or Plasterstone.—There are several varieties, but they contain few metals.

Clay.—There are several sorts, nearly allied to clay, and what the miners call *rubble stone*, which is a common variety of slate found in similar situations with slate, but often very rich in metallic ores.

ALLUVIUM.

THIS deposit has given great riches to the world, and is generally understood to consist of the loose earthy soil which covers the solid rock in every part of the globe; but more particularly the beds of rivers and water courses, whether left by floods or formed from the decomposition of the adjacent mountains. It has in general a gravel-like appearance, intermixed with pieces of rock of a larger size. These deposits are often of great extent.

Alluvial soil is moved by high tides, currents, and inundations, often forming shoals at the entrance of rivers, and on various parts of the coast: nay, heavy gusts of wind sometimes carry quantities of it away, having the appearance of a moving cloud, and changing the face of the country wherever it is deposited: nor is it uncommon for trees and herbs, or cattle, to be covered by it.

 METALLIC VEINS.

THEY are three—the *perpendicular*, the *pipe*, and the *flat*, or *dilated*.

1. The perpendicular.—This kind of metallic

vein occurs most frequently : it is various in its course or direction, thickness, and inclination. Metallic veins are found running in every direction, but, in general, the most powerful veins—that is, the most productive—are observed to run from north to south, or at least a few points in deviation from that course ; and, when any deviation happens, it is usually to the east of north, and to the west of south.

The course or direction of a vein is called, in technical language, its *bearing*. The extent of a vein, in the line of bearing, rarely exceeds the range of mountains in which it is discovered.

The inclination of veins is various : sometimes they are nearly perpendicular ; sometimes they deviate considerably from a perpendicular line ; sometimes the same vein, in its course downward, inclines to one side ; and sometimes it inclines to the other side. When the deviation from the perpendicular does not exceed ten degrees, the vein is still considered as a perpendicular, or vertical vein. When a vein is inclined, the two sides which include the metallic substances are in very different positions, and have consequently received from the miners different names : that side which supports the metallic ore, or on which it seems to lean, is called the *ledger side*, or simply the *ledger*. The opposite side, which

covers the ore, or which overhangs it, is denominated the *hanging side*, or simply the *hanger*. From the inclination of the vein being varied in its course downwards, it must appear that the same sides, according as the inclination varies, must change their position and denomination.

The thickness of veins, and indeed of the same vein, is also extremely various: sometimes they are only a few inches thick; from this they increase to the thickness of several feet. Some veins have frequently smaller veins, or, as they are called in the language of the miner, *strings*, which run off at an acute angle, preserve their course for some distance, not in general very great, gradually diminish in thickness, and, at last, are entirely lost among the contiguous strata. At the place of junction, the principal vein is always thicker. Some veins, it may be added, are found crossing each other.

2. Pipe Vein.—What has been denominated the pipe vein is extremely limited in the line of bearing, but having the same inclination as the strata which include it. It may be considered as, in some measure, of a circular form, extremely irregular, and always following the course of the strata, between which it is included like the perpendicular veins; sometimes, as it dips downwards, it is enlarged; sometimes it

is diminished; and sometimes it is so much contracted, that the including strata come into close contact. In a word, this kind of vein is subject to all the irregularities of the veins formerly described, only that its inclination is invariably the same with the accompanying strata.

3. The flat or dilated Vein—Is exactly similar to the pipe vein, only that is more extended in the line of bearing; it is included between the horizontal strata, and, therefore, its inclination or dip must be the same as the including strata. A vein of this kind might, with more propriety, be regarded as a metallic horizontal stratum, were it not that it is always found varying in its dimensions, and equally irregular as the perpendicular veins which intersect the horizontal strata; though, for the most part, the veins that are regular and run in the same direction are the richest: it has been observed, that those spaces the surface of which are most spangled with crystals, are those which furnish the greatest quantity of gold.

MOUNTAINS.

GEOLOGISTS agree, that there are certain rocks more ancient than others, and have deno-

minated those which are considered the oldest *Primitive*: thus, those of granite are said to be of the primitive formation, whilst others are considered of the secondary, or transitory; and a third class is styled the *Floetz*, or flat formation, being formed upon the primitive or secondary, and bounded by rocks of that description. It generally happens, that one particular mountain or chain of mountains is primitive, while the rest is secondary. The primitive substances occupy the base and central parts of the mountain, and often extend to its summit: the secondary cover these, and are generally found on the flanks or sides of the mountains. In a chain of mountains there are commonly three, and often five, parallel ridges, of which the central ridge is composed of primitive compounds, and those on each side of it chiefly or entirely of secondary compounds.

The materials of which mountains consist are disposed either in irregular heaps, or piles, variously intersected by rifts, or in beds, or strata, separated from each other by rifts, often horizontal or varying from that direction by an angle of from five to forty degrees, and sometimes more considerably, approaching even to a vertical position. The strata of mountains are most frequently in the direction of their declivity; yet, sometimes, their course is direct-

ly opposite, or countercurrent; the best manner of determining the angles of their course, is by discovering that of their rifts: it chiefly depends on the unevenness of the fundamental ground that supports them. Gold is found principally in primitive mountains.

C H A P. I X.

MINERALOGY.

THE origin of metals has not always been well understood; it was long thought that they were as old as the creation. It is now believed, with greater reason, that they are formed successively; in fact, it is impossible to doubt that nature is continually in action, and that she exerts herself with as much power in the bowels of the earth as in the regions of the sky.

Every metal, according to the chymists, has for its principle an earth which constitutes, and is peculiar to it. It presents itself to us sometimes in the form that characterizes it, and sometimes under various appearances, when it requires a degree of habit and skill to recognise it: in the first case, it is called native; in the second, mineralized ore. Metals, whether native or mineralized, are sometimes scattered by fragments in beds of earth that are horizontal, or inclined, but this is not the place of their origin; they have been conveyed thither by great volcanos, floods, and earthquakes, which are contin-

ually subverting our planet. They are commonly found in regular veins, but sometimes in detached masses, within the rocks and mountains where they are formed. According to the conjectures of naturalists, from these large caverns, which are perpetually heated, there arise continual exhalations. If in a mountain, say they, or any deep parts of the earth, a vapour should arise from a substance utterly unknown to us *à priori*, that lay either there before, or is generated on the spot; or if this substance itself, in the form of such a vapour, should successively rise and creep through the cavernous body of vast tracks of rocks, the veins and clefts of flints, or the interstices of huge beds of lesser stones, and everywhere move about till it impinges upon a certain species of a subtile vitrescible earth, which is fitted to receive it; or to become one therewith, here it must lodge as in its matrix, till some more powerful impulse disturbs it.

That these metallic principles may thus wander through the earth in the form of vapour, seems countenanced by the common observation of those mines which take their course near the surface of the earth. For if a mineral vein lies shallow, it often gives manifest signs of being supplied with such a vapour, not only in summer, by changing the colour of the stones

that lie over it, but also in winter, by dissolving the snow that lies along the tracks where it runs ; and this kind of exhalation is, by the miners, called the *Storm*. The like vapours also frequently arise by the burrows and caverns of a mine, whilst workmen are digging the vein for the metal already formed therein, and sometimes make the place very hot ; sometimes occasion coughs and hoarseness, and sometimes again, when they are large and mixed with other mineral vapours, they prove suffocative.

The contents of a metallic vein are frequently perverted at the time that a subterranean heat comes upon them, when, if the vein be superficial, the whole mass of metallic matter is corrupted and thrown off into the air, whence the remaining veins are afterwards found to be nothing but an imperfect matrix, containing a rusty red earth, like the *lapis hæmatites* that runs therein, after the manner of an ore indeed, but yielding no metal, whence such matter is by the workmen called *dead metal*.

This evaporation becomes sometimes sensible, though without flame or any manifest odour, but may be distinguished from afar, especially in a dewy morning, by the undulation and fluctuation which it occasions in the air over the track whence it rises ; and if, after such a phenomenon, the vein be found empty of metal,

the workmen, in their language, say, the *storm has carried it away*. But, at other times, such an exhalation is attended with a violent flame, and the smell of burning sulphur, reaching to the distance of a mile or more, when all the adjacent grass and other vegetables are burnt up, and the workmen sometimes scorched or suffocated in the mines.

It must be observed, that one kind of heterogeneous bodies either hinders the completion of metals more than another, or obscures them when they are complete, an example to which purpose we have in the gold ore that is intermixed with martial flints, where a dry, styptic, powdery earth, preventing the fusion, detains the fine single particles of the perfect metal, and separates and wears them asunder when they would aggregate, and so prevents the ore from yielding its true quantity of metal by fusion, or all that it is by *aqua fortis* found to contain.

Thus much for the origin of gold, according to those naturalists who imagine the precious metals to be produced by the influence of vapours acting, under certain laws, upon extraneous bodies; but some persons have imagined that gold is formed from the decomposition of auriferous pyrites, whilst others have thought that the agency of water is very considerable in the formation of the metal; and it may not be amiss

to give the theory of a modern writer on this interesting and curious subject:—

“I am not aware,” writes Mr. Luccock, “that a professed mineralogist ever examined the Serro of Lenheiro (St. Joan d’El Rey), with a view of ascertaining the first sources whence the gold is obtained, or the mode of its formation; and even now it must be done, if at all, only by a lover of science. The people immediately interested are too ignorant for such an undertaking, and those remotely concerned can procure the wealth without the labour of investigation;—my own remarks must necessarily be imperfect and unsatisfactory. To discuss this interesting subject as it merits, we ought closely to investigate the structure and composition of the granitic and gneissaceous mountains, and particularly those veins of quartz which run through them in plains more or less inclined to the horizon. This substance appears to me to have been formed in a period long since passed away from the component parts of water and the matter which it has held in solution, for the veins all tend to some larger one, and finally terminate in a general mass, which now fills what appears to have been a passage or chamber in the body of the mountain, and which, according to the language of Brazilian miners, may be called the *Culdeirao* or centre, or, perhaps, nucleus

of the quartz. These veins I conceive to be the only natural beds of gold ; the matrix in which it is formed, though not always enriched with metal, and in many respects answering to somewhat similar veins, in a different kind of mountains, where lead is discovered.

“ The serro of which I am speaking seems to be composed, internally, of a soft kind of *gneiss*, which is remarkably full of narrow veins of quartz, running through it in planes nearly perpendicular to the horizon. In these alone, and in no other part of the mountain, the gold is found in its matrix, running through the spar in small threads, or filling up every interstice which it finds between the crystals so completely, as to appear like metal fused and poured into a mould, of which it takes the exact form. From these and other appearances, therefore, I am inclined to think that gold is produced by the action of water upon quartz, already existing under some peculiar and yet unknown modification. If the metal had existed as a native and completely formed substance among the soft rudiments of the spar which are sometimes, even at this period, discovered, it would most likely have been detected there, which I believe has never been the case ; and if the precious metallic particles, by the hardening and crystalizing of these rudiments, have been thrown into a more com-

pact and tangible form, they must remain hidden in the veins until these are themselves worn down, reduced, and broken. The common *cascalho** of the country which contains gold, seems, indeed, to consist of the fragments of those veins which have been by some means broken up, perhaps several ages ago, rolled about by the action of water, in agitation, and buried by it among the clays which have composed its bed. These fragments and half-rounded masses, it is evident, must have contained the metal completely formed before the period of their disrapture, however long it may have been since that event took place; nevertheless, none of these cases prove that the process has not been continually going on, and that there is no recently formed gold; indeed, old miners say, that it grows,—that beds formerly wrought contain now

* *Cascalho*, indurated soil, in which gold is contained. There is a difference between the *cascalho* in the mountains and that in the rivers: the embedded stones in the mountain *cascalho* are rough and angular, but in that of rivers they are rounded. Hence it has been argued by some, that the gold in the rivers has not been brought down from the hills, as is commonly supposed; and also, because the gold, though found in lumps, has not been rounded, which, according to the common hypothesis, it ought to be, and because it is of a different quality from that in the interior of the mountain, whence the hypothesis would bring it.

a larger quantity than it is possible to suppose their ancestors would have left in them; to me, however, the evidence of this is by no means satisfactory.

“ On the upper surface of the Serro of Lenbeiro, and even on most of the clays over which I passed, there is a large quantity of feldspar and quartz, in nodules; yet it is said that no gold was ever found among them; indeed, these nodules seem to me to have been formed in a very different period and by a very different process, from that which has produced the auriferous veins; that none but these veins are the natural and native beds of the metal, I think must be evident to all who have examined the mines with care. Yet these veins are so narrow, so hard, so little affected by the action of water, and so completely secured from attrition of every kind, except on their outer edges, that it is impossible to suppose the quantity which has been obtained from the mine of *St. Joan d’el Rey*, should be derived only from the veins which terminate in it. A portion of precious dust must have existed on the soil of the mountain, and have been brought down from the surface by the waters which have flowed over it. It was placed there, I conceive, by the same means as the mica was when the solid rocks were decomposed. The caldeiraos, or those parts in

the body of the mountains where the metal exists in large masses, and almost pure, are of two kinds: those in the solid granite rocks seem to be the chambers whither the menstruum which held in solution the precious ore has tended,—where it has rested and deposited the metal with which it was saturated: those which are found in the softer mountains appear to be of later formation, and were probably the lower parts in the bed of a current, a lake, or the ocean, whither the heavy metal, previously existing in the form of dust among the mud of its bottom, has tended and been finally collected. Upon the whole, it seems to me, that all gold found in the state of dust, whether it be in the beds of rivers, among soils or sands, or even schist, has been subject to the action of water, and removed from the body or matrix in which it was first formed. Hence, probably, it is, that we find it more abundantly in valleys than on the summits and sides of hills, and in masses, either at considerable depths under the surface of mountains, or near that of low levels, and never in such a form in any other situation.”

NATIVE PLATIANA.

NATIVE Platina was first brought to Europe by Don Ulloa, in 1748: the repository of this

metal is not known, and it has been found only in some peculiar gold-washings in Mexico, and in one or two in Brazil. Platina is heavier than granular gold, and, in its crude state, is alloyed with other metallic substances; indeed, it has been long known that it is accompanied with particles of the more precious metal. If the quantity of platina to be purified be considerable, it is an object worth the attention of the chymist to separate and collect the gold, because the proportion of the latter contained in crude platina is not small. Proust, obtained seven ounces of gold from a quantity of platina consisting of one hundred ounces; and, from another quantity of the same weight, he separated not less than thirteen ounces of gold. It may be observed, that the platina which is whitest is found to be the richest, and that the black varieties scarcely contain any gold.

AURIFEROUS GALENA.

AURIFEROUS Galena, or the native sulphurate of lead, sometimes is combined with a little gold, and it is worked as one of the ores of gold.

GOLD.

GOLD, the most valuable of all metals, is of a bright yellow colour; it is not always found pure, being frequently alloyed with silver (sometimes in great proportion), or copper, or with both, and sometimes with platina. To these alloys the difference of colour, which is the foundation of the division into three varieties, is owing. The first variety is the purest, containing only a small proportion of silver or copper; the second has a greater proportion of these metals; and the third is alloyed with a small portion of platina.

The accompanying substances of gold, when found in the primitive mountains, are quartz, feldspar, limestone, heavy spar, pyrites, red silver, vitreous silver, and galena. Gold is also mixed with manganese, gray cobalt, nickel, and malachite: it is also said to have been found in petrified wood, penetrated with siliceous earth.

But gold is, perhaps, more common to alluvial soil; there it is disseminated in grains, along with silicious, argillaceous, and ferruginous sand, of which certain soils are composed, and also in the sand of many rivers; and it is observed, that the gold is most abundant when the

waters are at the lowest, and especially soon after floods, which induce some people to think that it is carried down along with the earthy matters which are swept away by the violence of the current. It has been imagined, too, that the gold found in the bed of rivers has been detached, by the force of the waters, from the veins and primitive rocks traversed by these currents ; and, according to this opinion, attempts have been made to trace the source of these auriferous sands, although hitherto without effect.

CHAP. X.

LAWS OF THE MINES.

FIRST CODE ISSUED AT VALADOLID, 15TH AUGUST, 1618,
AND REGISTERED AT LISBON, 30TH JANUARY, 1619.

It had long been known that the precious metals existed in the captaincy of S. Paulo. In the last year of the 16th century, D. Francisco de Souza, after his unsuccessful search for the mines of Roberio Diaz, sent to Philip III. a rosary composed of native gold ; and, in the year 1618, that king issued a code of regulations. Being informed that mines had been discovered, and that further discoveries might easily be made, the king, it was said, in order to show favour to his vassals, and for other respects which behoved his service, held it good to confer such mines upon the discoverers, that they might work them at their own cost, reserving to himself one-fifth of the refined produce, to be delivered at his treasury, free of all expense. Any person, therefore, who adventured to discover a mine, was to give notice to the *Provedor* whom the king appointed in those parts, and bind himself

to pay the royal fifths ; his declaration was to be registered and signed by himself. After these preliminaries had been observed, all persons in authority were bound to afford him the necessary assistance ; and when he should have succeeded in his search, the time and place of the discovery were to be entered, with all proper particulars, in the same book. He was to present a sample of the metal to the *Provedor* within thirty days after the discovery, and make oath that it had been extracted from the place which was registered on his account. If it should afterwards be proved that he had sworn falsely, he was amenable for all the expenses which other persons might incur by working at that place, in consequence of his deceit, and to be punished also ; and if the manifestation were delayed beyond the time appointed, unless a sufficient reason could be adduced for the delay, his privileges as a discoverer were forfeited. The privileges of the discoverer, according to the original code, were, that he should have one mine, as it was then called, of eighty Portuguese *varas* by forty, allotted him, and a second allotment, of sixty by thirty, upon the same *beta*, or vein ; both were to be at his own choice, but one hundred and twenty *varas*, being the space which two such smaller grants would occupy, were to intervene between his two portions. He had

thus the first choice and a second allotment, which was permitted to no other person. In running waters and in ravines, whether wet or dry, the discoverer's portion was sixty *varas* in length, and twelve in width, measuring from the middle of the water or ravine; that of the other adventurers was less by one-third in length; but if the stream were large, the discoverer was then entitled to eighty *varas*, and the other persons to sixty. In what were called *minas menores*, lesser mines, which were in the plain country, upon little hills, or by the side of the rivers, the allotment of the discoverer was to be thirty square *varas*, others having a square of twenty; but if the ground was not extensive enough for the number of claimants, the allotments were to be reduced in proportion, by the *Provedor*. No new discovery could be allowed in such places within half a league.

Any adventurer might demand a mine, but he could only have one, which was to be of the same extent as the discoverer's first portion: two days were given him to choose for himself; and the choice, having been once made, might not be altered; boundaries were to be raised, either of stone or earth, well compacted and beaten down, a *covado* high, and made in a durable manner. The person who neglected to raise his boundary forfeited his grant, and was subject to the same

penalty if he removed it; and, if any one had more than a lawful allotment, all beyond that measure might be taken by any person who should think proper to claim it. No one, except the discoverer, might have more than one allotment within the distance of a league and a half, unless he purchased another person's; but he who possessed a mine upon a rich vein, was allowed to hold another upon a poorer, though it might be within these limits, because rich silver ore melted better for being mixed with some of poorer quality. If more persons than one undertook the discovery, he who first found the ore was to be accounted the discoverer, and an adventurer might seek and work a mine upon private property, because it was for the king's service; but he was bound to indemnify the owner of the land for any injury which might be sustained.

Mines might be granted to such persons only as possessed the means of working and peopling them, seeing it was a disservice to the state if they were not worked and settled; if, therefore, a grant were not taken possession of within fifty days, it was forfeited, unless the delay had been caused by the want of tools, in which case the *Provedor* might extend the term at discretion; and it was not to be deemed settled (*provoado*) unless two labourers, at least, were constantly

employed upon it. It might sometimes happen, when the vein lay deep, that the discoverer could not get at it because of poverty, and that others who possessed allotments there would not work to extract ore for his benefit; but this was injurious to the king's service, and therefore all other adventurers were bound to assist him in digging to the depth of ten *bracas*, upon payment of a fourth part of the value of their labour; when they should reach the true vein, then they might demand the full price. By another provision, every person seeking for gold was required to continue the search till he came to the rock. It had been shown by experience, in Peru and Mexico, that where the veins were certain, and lay deep, it was easier to reach them by horizontal shafts than by sinking; an entrance, therefore, might be made wherever it seemed best, even though it should prove to be from the open mine of another adventurer; and in such cases he was bound to allow entrance during fifty days, in which time a pit might be sunk for the service of the mine. Every miner was expected to lay his rubbish upon his own ground; he was not to annoy his neighbours with it; and, should he cast it into a stream, he was responsible for any damage which it might occasion. In order that the mines might prosper, and that *engenhos* and dwelling-houses

might be erected in the mining country, adventurers were admitted to all common rights of the district: they might turn their cattle into the lands of the *conselho*, upon the public ground, and even upon private estates if it were necessary: in this case they were to pay the value of the pasturage, but the owner had no power to forbid them. No man could be arrested for debt while he was engaged in mining, neither might distress be levied upon his slaves, tools, provisions, or any thing needful for the work: the public interest, which was paramount to all other, being concerned in facilitating such operations.

The superintendence of the mines was vested in a *Provedor*; he and his secretary were to visit them as often as they could, to see that all was in order; and they should not allow any idlers or vagabonds to remain there. Neither they nor the treasurer were to hold any share directly or indirectly, nor to trade in the metal, on pain of losing their offices, and having their whole property confiscated, a like confiscation attaching to those who traded with them. The *Provedors* decision was final in all disputes, to the amount of sixty *milreis*. An appeal lay to the *Provedor Mor da Real Fazenda*, in causes of greater value. A refining-house was to be erected at the expense of the treasury, and no person be

allowed to enter it without just cause. Here all the ore was to be melted; it was to be weighed and registered again, and stamped. The fifth was then to be taken and deposited in a chest, under three locks; the keys of which were to be kept by the treasurer, the secretary, and the *Provedor*. The stamping-iron was to be kept in this chest, which was never to be opened, except in presence of these three persons. The punishment for selling, exchanging, giving, embarking, or possessing unstamped gold, was declared to be death and confiscation of property, two-thirds being forfeited to the crown, and the remainder assigned to the informer as his reward. A yearly account was to be returned of all the discoveries and produce.

REGIMENTO DAS TERRAS MINERAES, 19th APRIL, 1702.

It was found in this year necessary to alter the existing laws. A greedy desire of gain induced the powerful, as the new code called them, to solicit so many grants, that none were left for poor adventurers: the former code seems therefore to have been disregarded, or to

have fallen into disuse. These men of influence had not means for working the numerous grants which they monopolized, so they sold them to those whom they had forestalled, or let them lie unopened, in the first case to the injury of the people, and in the second to the detriment of the revenue: therefore, it was enacted that, no second grant should be made to any person till he had worked the first; and if ground were still remaining after all the adventurers had received their allotments, it should be apportioned amongst those who possessed more than twelve slaves, a certain quantity being allowed for every additional herd. On the other hand, when there were more claimants than could find shares in the extent of ground upon the scale prescribed, the proportions were to be lessened, that all might be satisfied, as well the poor as the powerful; though it should be necessary, said the law, to measure the ground by spans instead of fathoms. The allotments were now regulated by the number of slaves which the miner employed, in the ratio of two *braças* and a half for each. Besides its fifths, the crown took to itself an allotment, to be marked out in the best place after the discoverer had taken his first grant, and before he had chosen his second; and, if an adventurer did not begin to work his ground within forty days,

a third part of it, upon information of the lapse, should be assigned to the informer, and the other two-thirds fall to the crown: but distance, want of provisions, bad weather, and ill health might be pleaded against the forfeiture; and, if this plea were substantiated, it was to be held good. The royal allotments were to be let by auction, after nine days' notice, and the law declared that the powerful should not be suffered to prevent the poor from bidding for them. If the bidding were not thought high enough, the superintendent was then to see them worked for the treasury, by Indians paying them the same price for their labour which they would have received from private individuals. The inconvenience of this was soon perceived: it was then determined, that if the crown allotments were not leased, adventurers might work them at their own expense, and take half the produce; the preference in such cases was to be given to persons of most conscience and credit, a necessary proviso when these persons were to work for half the produce of the mine, and all the other adventurers for four-fifths. No officer of the treasury or of justice might possess a grant,* nor share in one, nor derive from the mines any other emolument

* Carta Regia, 7th May, 1703.

than his salary, on pain of loss of office, and forfeiture of all his forbidden gains, with a three-fold fine, one third going to the informer. Any person engaging with an officer in such transactions, should forfeit his grant as well as his profits, and a heavy fine was imposed upon the *guarda mor*, or superintendent, who should connive at these proceedings. The salary of the superintendent was fixed at 3,500 cruzados; the *guarda mor* had 2,000; the *guardas menores* 1,000 each; and in that ratio for the time these latter might hold these appointments. The appointment of a treasurer was vested in the superintendent. He was to be one of the principal and wealthiest inhabitants, with a salary of 3,000 cruzados; and, if the funds appointed for these payments fell short, the deficiency in this case was to be supplied from the fifths.

As this officer could not be present at every place where his services were required, he was to have deputies, with salaries of five hundred cruzados each. The law said that, because all these officers were created solely for the advantage of the mines, it was fit that the miners should provide their salaries: each adventurer, therefore, was taxed in a tenth of the sum for which the royal allotment was let; the assessment, however, being lowered in proportion to

the inferior quality of an allotment. This law also was soon revoked, and the privilege of mining was conceded to the officers in lieu of a salary. The prospect of gain must have been very attractive, if this commutation were as agreeable to the officers as it would be to the miners.* Upon the face of this law, it appears to give them nothing but what they might have claimed as simple adventurers, and to impose upon them the burden of office without reward.

Holders were not allowed to sell their grants, for the purpose of obtaining others in better situations; this practice was forbidden, on pain of forfeiture of a year's value, from both parties: but he who could not work his grant either for want of slaves at first or afterwards, by reason of their death, might, in such case, obtain a license from the superintendent to sell that license, disqualifying him from receiving another allotment, unless it were proved that he had obtained slaves enough to benefice it. When a discovery was made upon the banks of a river, the artifice was sometimes practised of asking time to examine the ground, and employing that time in working it to defraud the government, by securing the first fruits. To prevent such frauds, eight days only were to be allowed for examination, and

* Carta Regia, 7th March, 1703,

the discoverer, if he exceeded that time, forfeited his claims. But it was difficult to lay down a positive law, for cases which might be so greatly varied by circumstances: it was provided, that this term might be enlarged at the discretion of the superintendent, when the *ribeiro* or bank was extensive, and the *catas* or searching-places deep. Allotments on the shore were to be straight, not measured by the course of the water. When gold had been discovered in the bed of a river, claims were sometimes made for new discoveries in the streams which fell into it; these claims were to be allowed or not, according to the magnitude of the streams. This was a point of some importance, for the fortunate adventurer who made four discoveries was entitled to four allotments in the last, instead of two. The whole ordinary, civil, and military authority was vested in the superintendent; and, because of the distance of the mines from the capital, definitive powers were allowed him in treasury causes, to the amount of one hundred *milreis*: for other and graver cases, an appeal lay to the supreme court at Bahia. Secret information would be received of any frauds committed upon the government, that proceedings might be instituted against the offenders, conformably to law. Any person might go from the mines to Bahia, for the purpose of pur-

chasing cattle with gold dust; but, unless he previously paid the fifth and provided himself with a certificate, whatever he took with him was confiscable. The ingress was not equally free, no person being allowed to enter from Bahia, except the drovers.

In 1714, grants of land were to be made sparingly in the growing captaincy of S. Paulo; and no person who obtained one grant might obtain another, either by purchase or inheritance.*

In 1724, the *Poderosos*† took possession of the water-courses of the mines, and diverted them to their own grants. Persons of less influence were then obliged either to purchase water from these *great men*, at an exorbitant rate, or pursue the old manner of working. The *Guardas Menores* were empowered to allot the water, according to the means of the miners, and an appeal lay from them to the superintendent of the *Comarca*. No person might appropriate the waters of a stream, without a written license from the *Guarda Menor*; and that license was null if he had no grant to work, or no slaves wherewith to work it. Custom was allowed to

* Carta Regia, 15th June, 1711.

† Persons of great power and influence—generally commercial men, or men holding official situations.

establish it as lawful for those who brought water-courses upon the mining ground at much expense, to dispose in that case of the water: if a spring was found upon digging in a grant, it belonged to the grantee: the surplus water from any reservoir which the miners made was at the *Guarda Mor's* disposal.

1730. At this period the mines were abundantly productive, and some relaxation took place in the laws, principally occasioned by some new discoveries. Such multitudes flocked where gold was newly found, that it was no longer possible to observe the old regulations concerning grants, and the government found it expedient to yield an authority which could not be maintained. The concession was made in time, and in such a manner as to appear an act of grace rather than of necessity. Great crowds had assembled on a new discovery at the Morro de S. Vicente upon the Rio das Pedras, one intruding upon the ground which another had appropriated; so that, instead of extracting gold, all were engaged in tumults and contention. The government therefore proclaimed that the ground here should be common to all the people, and that no grants should be made, only a certain distance was to be left between the openings. The Camara* of

* Camara—The chamber or corporation of a town.

S. Joan d'El Rey* represented that a few individuals claimed to themselves the whole hill at the Rio das Mortes, and the people, because they had no mining-ground whatever, were deserting the town. In a case of this kind there was no time for a reference to the home government: D. Lourenço therefore gave notice that no man should appropriate more ground than his legal proportion, according to the number of slaves whom he employed; and, as the hill was of great extent, there was room enough, he said, for the negroes of the inhabitants to mine and search for gold, without interfering with the works of those who had brought water to the ground; for, he added, it had always been the custom in the towns, that the adjoining hills should be common gathering-places for all the inhabitants. Here the grasping disposition of a few *Poderosos* had provoked resistance; but six years afterwards, when the *Morro de Cattas Altas* was opened, the people demanded that it should be declared common property, free for all to work who chose; and it was proclaimed accordingly, that no person should appropriate ground to himself under any title, but that all might take the benefit of it, and employ their slaves there.†

* Bando, 22nd March, 1728.

† Portaria, May, 1734.

C H A P. XI.

THE MINES.

THE word Mine, in the signification attached to it by the inhabitants of Brazil, conveys a different meaning to that which it imports in Europe. Whilst in the latter it designates a subterraneous excavation, in the former it is simply applicable to the bed of a river, the bottom of a ravine, or some peculiar place, of greater or less extent, where the soil is composed of alluvial matter.*

Nature, which seems to have intended to conceal the precious metals from the avidity of man, has nevertheless been unable to secrete them, and, from repeated observations, the places are discovered with tolerable accuracy where there are mineral deposits.

1. Mines are commonly found in high mountains, because the heat concentrates and unites better there than in low grounds, and consequently there is a stronger fermentation for the production of metals.

* The general characteristic of mines, as is understood by that term in Brazil, is here stated, although there are, in point of fact, some few exceptions to the description given.

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2. Where the waters are impregnated with vitriolic salts, and, as in the captaincy of Minas Geraës, where sulphureous springs exist: if the waters be warm and have a strong mineral taste, the probability of a neighbouring mine is the greater, for the spots where metals are generated are always environed with these waters, which occasion no small trouble and difficulty to those who work in mines.

3. Where the ridges and tops of mountains, their chinks, cavities, or pits digged in them, do yield any marcasites or pieces of metals, for that is a sign that there is a mine somewhere near, and to alight upon the treasure, the string or track of these marcasites must be followed.

4. Where marcasites or metallic matter of any description is found in any rivulet or spring, for it may happen that such metal has been carried thither by the waters which commonly come out of the mountains, and, thus by tracing the rivulet or water to its head, the spot whence the metal originally proceeded is ascertained. The same may be remarked where metallic particles are found in sand or any other earth.

5. Where the mountains are found to reverberate.

6. Where the soil is bare and barren, with no trees, or having very few plants upon it; or where those that do grow, are pale and without

any fresh colour, for the mineral vapours which issue through the pores of mountains burn the roots of these plants. Sometimes, however, metals are met with in very green and fertile mountains, where there are many trees and other plants, the metallic vapours either ascending there in a less quantity, or are of a different nature, and so do not hinder the growth of plants; or perhaps the mines lie at the bottom of these mountains, or they may be covered with some hard stone, which intercepts from the plants the exhalation of the vapours.

Finally. Some persons skilful in mines pretend to know whether there be any mineral in a mountain by adverting to the reflection of the sunbeams, there being so much water in mines which necessarily must be drawn off; therefore, they commonly rather begin at the foot of the mountain than at the top, because the waters may this way be more easily drained.

Though each of these marks separately considered be ambiguous, it seldom happens, when all of them are united, but that the earth contains some mine.*

* The best situation for a mine is a mountainous, woody, wholesome spot, of a safe easy ascent, and bordering upon a navigable river; and such a place as this being the standard of goodness, all others may be judged of as they approach to or recede from it.

At a very early period gold was found by the new settlers in Brazil : Ayolas is stated to have discovered it in the interior about 1543, and at the same period the precious metal was seen by Yrala. The manner in which it was ascertained to exist is differently related : the most common account is that the Indians on the back of the Portuguese settlements were observed to make use of gold for their fish-hooks, and, inquiry being made as to the manner of procuring the mineral, it appeared that considerable quantities of it were annually washed from the mountains and left amongst the gravel and sand that remained in the valleys after the running-off or evaporation of the water.

In general, gold is met with in Brazil of all the colours and forms hitherto known : the first are bright yellow, brass, and greyish yellow, in which last the alloy of silver is so considerable, that the gold-dust acquires a brownish tarnish by oxydation. With respect to the forms, the loose, roundish, or flat grains are the most frequent, but other configurations are also seen. The gold washed out of the sands of rivers is mixed with quartz-sand, partly pure, partly mingled with mica and lime. Some gold-dust also contains magnetic iron stone, and with grains of cinnabar.

The tapanho-acanga, or the iron-stone flötz,

subordinate to the guadersandstein formation, is the secondary bed of the gold, in which its abundance in all forms is astonishing; whereas, in Europe, this iron-stone formation, considered as a whole, and in its separate members, is very extensive—for instance, in the kingdom of Bavaria—without containing any traces of gold. In the quartz strata, and beds of the clay-slate, and of the quartz and iron-mica slate, the gold is particularly beautiful, dendritically and reticularly knitted and aggregated in rows. From what is called the black gold formation, arsenical pyrites and iron stone, containing manganese, occur, besides small crystals in cubes. But the most beautiful form of gold is that in iron mica-slate, particularly in the large foliated, generally undulated curved, in which pieces weighing several ounces are often discovered. It cannot but be observed, that in Brazil the gold occurs in such abundance with iron mica, whereas, for example, at *Fichtelberg*, in Bavaria, where iron mica is frequent in quartz, no trace is to be found of it.

In 1595, there were, along the whole coast of the Spanish main, rumours of an inland country which abounded with gold.

In 1610, Syward heard of some little gold having been found—“*vers la rivière de S. Vincent, il y a des mines d’or qu’ils tachent à conquérir, et en tirent déjà quelque chose.*”

In 1637, search was made for mines by the Dutch: they proved fruitless. Mines, however, existed, but those who knew the secret kept it for better days.

In 1639, Teixeira held some communication with the inhabitants bordering on the river *Yurna*, from whom he obtained some golden ornaments: the gold was assayed at Quito, and proved to be of twenty-one carats, although no accurate account could be obtained whence it came.

In 1644, the Jesuits were accused of having discovered rich mines of gold, which they concealed for their own use.

In 1645, great rewards were offered to any person who should discover a mine.

In 1648, Fleckno says a gold mine had lately been discovered in the territory of S. Paulo.

In 1655, gold was coined in S. Vincente, and the ordinary currency in this part of Brazil was in this metal.

In 1692, Carlos Pedrozo da Silveira received a commission as *Capitain Mor* of the town of Taboate, and was appointed Provedor of the Royal Fifths, with orders to establish a *fundiçam*, or smelting-house, in that town, being the place where the first conquerors disembarked. The erection of this *fundiçam* had the same effect as a proclamation from government would have had,

announcing that there was gold in the land, and inviting all persons to search for it.

The first gold which is certainly known to have been produced in Minas Geraës, was a sample of three *oitavas*, presented in 1695 to the *Capitain Mor*, of *Espirito Santo*, by Antonio Rodriguez Arzain, a native of the town of *Taboate*, since which period it has been discovered in all the districts of which the captaincy is composed.

The news of gold having been found in Minas Geraës soon attracted there a great number of Paulistas and Europeans. It was, however, in 1703, that the principal influence of adventurers to the mines took place : meanwhile, discoveries of gold continued to be made. In 1714, one piece of native gold was found, which was worth 700 milreis (nearly 200*l.*) Three others of nearly the same size, and one of the value of 3000 crusados (300*l.*) were also about this period dug from the earth, although the latter had the disadvantage of lying deep.

At the commencement of the mining system in the Brazils, the common method of proceeding was to open a square pit, which the workmen called *cata*, till they came to the *cascalho* : this they broke up with pick-axes, and, placing it in a *batea*, a wooden vessel, broad at the top and narrow at the bottom, exposed it to the action of running water, shaking it from side to

side till the earth was washed away, and the metallic particles had all subsided. Lumps of native gold were often found from twenty to one hundred *oitavas* in weight; a few which weighed from two to three hundred, and one, it is asserted, of thirteen pounds, but these were insulated pieces, and the ground where they were discovered was not rich. All the first workings were in the beds of rivers, or in the *taboleiros*, the table-ground on their sides.

In 1724, the method of mining had undergone a considerable alteration, introduced by some natives of the northern country; instead of opening *catas*, or searching-places, by hand, and carrying the *cascalho* thence to the water, the miners conducted water to the mining ground, and, washing away the mould, broke up the *cascalho* in pits under a fall of the water, or exposed it to the same action in wooden troughs, and thus a great expense of human labour was spared.

At the commencement of the present century, there was a general complaint in Minas Geraes, that the ground was exhausted of its gold; yet it was the opinion of all scientific men, and still continues to be so, that hitherto only the surface of the earth had been scratched, and that the veins are for the most part untouched. The mining was either in the beds of the streams or

in the mountains ; in process of time the rivers had changed their beds ; the miners discovered that the primary beds were above the present level, and these they called *guapiaras*; the next step is the *taboleiro*, which seems to be close by the side of the *veio*, or present body of the stream. All these are mining grounds : the first is easily worked, because little or no waters remain there ; the surface had only to be removed, and then the *cascalho* was found. In the second step, wheels were often required to draw off the water ; the present bed could only be worked by making a new cut, which is called *valo*, and diverting the stream, and, even when this is done, the wheel is still wanting. The wheel was a clumsy machine, which it was frequently necessary to remove, and fifty slaves or more were employed a whole day in removing it. This was the only means in use for saving human labour, for not even a cart or hand-barrow was to be seen ; the rubbish and the *cascalho* were all carried in troughs upon the heads of slaves, who in many instances had to climb up steep ascents, where inclined planes might have been formed with very little trouble, and employed with great advantage.

River mining, however, was the easiest and most effectually performed ; it was, therefore, the commonest. But the greater part of those

streams which were known to be auriferous had been wrought. The mountains were more tempting, but required much greater labour; a few *braças*, if the veins were good, enriched the adventurers for ever, and, in the early days of the mines, the high grounds attracted men who were more enterprising and persevering than their descendants. The mode of working in such ground is not by excavation, but by what is called *talho aberto*, the open cut,—laying the vein bare by clearing away the surface. This labour is immense, if water cannot be brought to act upon the spot; and, when even there is water, it is not always easy to direct it, nor will the nature of the cut allow always of its use. When the miners found no *cascalho* in the mountains, they suspected that the stones might contain gold, and they were not deceived in the supposition. This is the most difficult mode of extraction: the stones were broken by manual labour, with iron mallets; in a few instances only, one machine was worked by slaves, instead of cattle.

The modes of mining having been so imperfect, it has not unreasonably been concluded, that now, when more scientific means are about being adopted, Brazil is likely to yield a greater quantity of gold, than at any former time.

AGNA SUJA, fifteen miles N. E. of St. Cruz da-Chapada, and twenty-five from Bom Successo. The inhabitants are partly gold miners.

ANNA ST. DE SAPUCAHY,—two leagues to the north of St. Vincente. The gold-washings are of considerable extent; at a distance they resemble skilfully erected fortifications. Trenches, several feet deep and broad, are dug upon terraced declivities, for the purpose of conducting the rain water into the open sides of the red loam.

ALTO DE VIRGINIA.—Here are extensive gold-washings.

ALTOS DE ST. MIGUEL,—mountain on the Rio de St. Miguel. Here are vestiges of ore of one of the oldest and most extensive gold-washings.

ANNA S. DO FERROS,—formerly called *Barra Bacalahão*, on the Rio Piranga. The gold washed here is so fine, that it often forms a thin skin floating on the water, and therefore cannot be well separated, except by amalgamation. In performing this operation, the amalgam is exposed in an open crucible to the fire, and catches the volatilized mercury in a pisang-leaf, formed into the shape of a cornet.

ANTONIO PERREIRA,—eight miles N. E. of Marianna. The mountain in which the mines of this place are situate, is of the same geological

character as the auriferous morro of Villa Rica ; in one of them, the proprietors, perceiving that the indications of richness grew stronger as the workmen penetrated the hill, determined on opening a cave directly into it ; for which purpose, they engaged between fifty and sixty slaves for more than twelve mouths ; at the end of that period the roof of the excavation gave way, and killed fourteen or fifteen of them ; the remainder were employed nine or ten months longer, in clearing away the loose earth and reaching the cave. They worked at it one afternoon and part of the night, when the whole side of the mountain broke in, buried nine more of the people, and produced a hopeless ruin. The treasure extracted during the short time which the mine remained open, was stated to be 24,000 cruzados, sufficient to repay all the losses, and to leave a surplus for wages, amounting to the rate of about five shillings per day for each person employed.*

BARBACENA,—thirty-five miles E. S. E. of St. Joan d'El Rey, and fifty S. S. W. of Villa Rica. Some of the inhabitants employ themselves in looking after gold.

* In the Diamond District, negroes are let to work at the washings for three vintems of gold per day, equal to about eight-pence sterling : they work from sunrise to sunset, with some little intermission at noon.

BARRO.—There are gold-washings in this neighbourhood.

BARBARO.—Idem. ,

BENTO RODRIGUEZ,—three leagues from Marianna. The country is auriferous, the gold being found in red clay, which is incumbent on quartz-slate in all directions.

BARBARA, SAINT,—on the road from Villa Rica to Tejuco. Gold-washings appear in all directions.

CATAS ALTAS DE MATTO DENTRO,—eight miles from Inficionada, formerly a large and flourishing arraial,* has fallen into decay with the decrease of gold: the deep mines wrought for the extraction of gold were the origin of its name.

Amongst them is the Guarda Mor† Innocencio's: it is a large excavation, open to the heavens, in the side of a mountain, which has been worked for these eighty years, formerly by a great number of negroes, but now only by eighty. On the white quartz-slate which forms the main part of the whole mountain, there is here a thick layer of ferruginous or iron mica-

* Arraial—plural, arraiaes, properly a camp, used in the mining provinces for the first settlements of the miners, and now applied there to any place which has not been chartered as a town.

† The guarda mores are the surveyors and appraisers of estates, particularly of the mines.

slate, which is bare to the height of thirty or forty fathoms, resembling steep steel grey walls. This rock consists of a fine-grained smoky-grey quartz and steel-grey small-grained iron glance, which supplies the place of the common mica. It is generally thin, seldom in layers a foot thick, often when the proportion of quartz is considerable, almost crumbling and coated at the rifts, with yellowish brown iron-ochre : here and there a large foliated massive iron glance, generally undulating, occurs in it. The iron mica slate runs in hour 22 of the miner's compass, from N. to S., and dips in angles of from 50° to 80° to the E.: it may contain from fifty to seventy per cent. of iron, according as it is more or less separated from the quartz. There are transitions into pure iron glance, but still more frequently into quartz slate, which constitutes the chief formation, and to which it is only subordinate as a thick layer towards the summits of the mountain ; this formation is covered by the iron-stone flötz, in which large pieces of quartz are embedded. The greatest and richest pieces of iron ore, which cannot be broken in the gold-washing, are carried by the negroes on their heads out of the mine, and piled up at the foot of the mountain in a high wall, which would be sufficient to employ the greatest smelting-house for several years. The gold is of a proper gold

yellow colour, and occurs between the iron mica-slate in fine grains, which show many single planes of crystallisation, and are sometimes so grown together that they form long, thin, reed-like rows, touching one another several inches long. In the stratified iron stone and in the quartz, gold is likewise met with, but still more on the rifts of the massive iron-glance. In the rainy season an impetuous stream falls from the upper part of the mountain into the hindermost ravine, which forms the bed of the iron mica-slate, brings with it the particles of gold, separated from the stratified iron-stone on the top of the mountain, and likewise washes the deposit of the crumbling iron mica slate. Part of it is conducted into a pond below the *fazenda*, and the precious metal washed out with the bowl. The gold here acquires a very bright yellow colour in smelting, probably from the considerable mixture of manganese, arsenic, and antimony, perhaps, too, of a little platina, which it has been asserted was obtained. Near this mine is another, where, however, the iron containing a little gold is stamped as well as the quartz.

CATA PRETA,—at the foot of the Serra do Caraça. Here are several gold mines, which were formerly very rich. The metal obtained from the stones by stamping is remarkable for its

grey yellow colour, and, when properly smelted, may be purified to the fineness of twenty-three carats.

CAETHE,—twelve miles E. S. E. of Sabara. The inhabitants amount to 5271, part of whom are miners. Here is a mine said to be eighty fathoms deep. The gangue is quartz traversing chlorite slate, which afterwards loses its colour and becomes *talc slate*: it appears poor ore.

COCAES,—nineteen miles from Catas. Near this place is a mountain, where the *cascalho* is found at a very small depth below the surface of the summit. Between this mountain and the village of Sabara is a rich mining district, which extends also to Bromare over a continuation of hilly country. It is occupied by many opulent miners, who possess many fine grounds still unworked.

CONCEICAO,—is now almost deserted, from the decrease of the gold mines. The vestiges of old gold-washings are seen in every direction, and the slight quantities of the precious metal found in all parts, from the summits of the mountains to their bases, might almost lead a traveller to conclude that the whole country was at one period auriferous.

CORVOS,—a village hastening to decay on account of the decrease of the gold. It has still, however, some gold-washings, and, about

1809, a net profit of 800*l.* was got from them, although only four negroes were employed one month upon the task.

CRUZ, S. DA CHAPADA,—ten miles N. of Successo. The inhabitants follow mining.

CAPAO.—Six and a half leagues from this place is a mine, belonging to Romualdo Jozé Monteiro de Barros; the principal vein extends from N. to S., and is from one to twelve inches thick. The metal is disseminated in the friable quartz, which is covered on its rifts with an earthy coat, containing manganese in such small particles, that they frequently cannot be distinguished by the naked eye: the vein is in some places uncommonly rich on this metal. The clay-slate, which is frequently coated on the rifts by black dendritic manganese, contains gold, but in this mine they work only the quartz vein (veas filoës). To uncover the latter, the owner has had the mountain washed away in many places, by means of a strong current of water, and thereby made so many steep ravines in the already soft rock, that he can scarcely continue to work the veins farther, without danger of their falling in. It would have been more advisable to commence a regular work, with adits and shafts lined with planks: the gold obtained here is generally twenty-two carats fine.

CHAPON,—(leading to Villa Rica from St.

John d'El Rey). This mine is nothing more than an open quarry, and is wrought as such. It contains a great quantity of cascalho, embedded in clay and sand, from which cascalho gold is collected in the usual way.

CRASTRA,—near José. There are gold-washings in this neighbourhood.

CONGONHAS DE SABARA,—near the town of Sabara. Amongst the mines here, is that of the *Padre Antonio Freitas*: it is situated in an immense ravine, which has been worked almost through the heart of a mountain of chlorite-slate, intersected by quartz-veins, in which the gold exists in combination with arsenical and iron pyrites. The chlorite-slate which is highly inclined also contains gold in the proximity of the veins, and, as well as the quartz veins, is carried to the stamping mills, of which there are five progressively powerful, and the ore is pounded by two before it arrives at a third and last. The larger blocks are split by means of gunpowder; but, if that article is scarce, the masses are heated by fire, and water is then thrown over them. There are about seventy slaves employed in the various occupations of quarrying, carrying, and washing; and with these means and powerful water-mills, the quantity of gold produced is large, being from twenty-five to thirty oitavos daily. The expenses

are calculated at one and a half oitavo per week for each slave employed, which sum is sufficient to cover every expense of purchase, machinery, and food. The gold is considered of low *logue*, as it seldom exceeds nineteen carats. There are woods in the neighbourhood of the mine.

ESTREMA,—one hundred and fifty miles from Villa do Principe. Gold abounds in this neighbourhood.

TECTINHONHA.—This river is rich in gold.

GASPAR SOARES,—a village nearly deserted, the gold-washings having failed.

GONZALO,—on the river Sapucahy, three leagues N. N. E. from St. Barbara, four leagues S. E. of Villa da Campanha; possessed, about thirty years ago very considerable gold-washings: the place is now hastening to decay, although the inhabitants still obtain from two to four thousand crusados from the mines. The mountains consist of granite; here and there veins of quartz traverse the rock in manifold directions, and these always abound in disseminated gold. The miners, however, do not look for and follow them, except when the surrounding rock is so entirely disintegrated, that it yields the profit they seek, without being worked according to the proper rules of the art of mining. Wood abounds in the vicinity.

GRANDE, RIO.—The mountains near this stream contain great quantities of gold.

GONGOSCO, to the E. of Caete,—situate on the banks of a river, the sands of which are perfectly black. Here is a mine of which the gold is of a deep yellow, containing palladium: it is raised from the *farmação preta* or black formation, which is, in fact, micaceous iron. The place is surrounded by woods.

INFICIONADA, arrail and parish of,—fifteen miles north of Marianna, derived its name from the circumstance of the refuse of gold in melting being at first excellent and becoming afterwards inferior, so that it acquired the name of *Oiro Inficionado* (infected gold).

IOZE, St.—eight miles N. N. W. of S. Joan. Some of the inhabitants are miners.

ITAMBE,—on the river of the same name, (from Villa Rica to Tejuco) is very poor, as the gold in the vicinity has failed.

IOAO, SAN, near Catas Altas.—Near this place are gold-washings.

ITACOLUMI.—By the road-side in this neighbourhood there are some trenches, where gold-washing has been carried on.

LAVRAS VELLHAS.—There are gold mines in this neighbourhood.

LUZIA, Santa,—fifteen miles from Sabara: part of the inhabitants are miners.

LAGOA DOURADO, twenty-four miles from St. John d'El Rey. In the vicinity of this place are several gold-washings, that were formerly very rich. At the east side of the town, where the waters from the mountains unite, there is abundance of *cascalho*, which contains gold, and is wrought in the usual manner. But the principal mine is on the west side of the hill, and close to the town, where the speculators have commenced their operations, by digging into the bottom of the hill, and excavating an area, three sides of which are formed by the rock, and the fourth is open towards the west. The texture of this rock is a soft red stone, or rather indurated clay mingled with mica, like the common soil of the country. In one part of the cleared area a hollow has been made, towards which there are channels from every part of the mine; so that all the water which can be conveyed thither, goes into the well, and, having no other outlet, flows over its sides into a rivulet at the foot of the hill, passing towards the north. In working the mine, the earth is thrown into the channels, and conducted through them by rakes and other means, until it falls into the well, where, in consequence of new agitations, the metal sinks to the bottom, and is separated from the refuse matter. This is really, nothing more than a quarry, though called a mine, and in many

points resembles that whence stone is procured at Liverpool: it appears about half as large as the *Parys* Mountain mine was twenty years ago, and fully as deep. The miners are encouraged to make such excavations, not so much for the sake of the metal, which they look to meet with in its more common form and quantity, as with the hope of finding a *caldeirao*, or mass of gold, one of which repays a man for the labour and expectation of several years.* These masses are generally indicated by filaments of metal running through the matrix, whatever it may be, and terminating in a nucleus, the weight and richness of which can never be previously calculated. Such filaments, however, do not show with certainty that there is any mass to which they lead, for very often they break off, and altogether disappoint the anxious adventurer. There is also frequently found, in such mines, foliated gold, the particles of which much resemble the mica of decomposed granite: these are richer and heavier than the common dust, and of course esteemed a more valuable prize.

MORTES, RIO DOS.—The land on the south side of this river, after it has passed the town of

* At the *Arrayal of Agua Quenti*, in the province of Goyaz, a piece of native gold was found, which weighed forty-three pounds: it was sent to Lisbon, where it still was in 1796.

Joan d'El Rey, is remarkably broken and full of precious metals.

MORRO DA GAMA.—Mines were opened here about 1736.

MANDA.—About two miles from this place, and to the N. of *Rio Serve*, are gold-washings. The rock is a quartzite white, or whitish green mica-slate, which here and there shows a dip from S.W. to N.E. and upon it lies a considerable mass of red heavy loam, from which the metal is washed. The greater part of this tract is covered with wood.

MARIANNA, near Villa Rica. Gold mines are everywhere to be seen in this neighbourhood.

MORRO DOS RIOS.—There are gold-washings in this quarter.

MAINARDE, RIO.—Near here are gold-washings.

MATAZINHOS, two miles from St. Joan d'El Rey.—At this place are the ruins of a large gold-work, which consisted of a wall built across a ravine to serve as a dam to keep up the water, and to stop any sediment which it might bring down. There was a sluice for emptying the dam occasionally, to afford an opportunity of taking out the sediment, and extracting the gold which it contained. The greater part of the wall was well secured by a solid bank of earth thrown up against it; but that part which crossed

the bed of the stream, was left unprotected, to serve as an overfall for the water when the dam was full. The engineer, however, had known nothing of the pressure of fluids, though enjoying the highest reputation of any one in the country. He had made his wall about thirty feet high, twelve feet wide at the bottom, and six feet at the top: the foundation had been insecurely laid, and, as if to keep the whole work solid, the top tier of stones was very large, weighing two or three tons each, and had been laid in their places at an immense expense: a skilful and practised mechanic will easily perceive that such a work must be blown up at the base, when the water is admitted into the dam, which was the case, and the whole expense, amounting it is said to 16,000*l.* was lost in a moment.

MARANHAO, RIO.—This stream has produced considerable quantities of gold; the washings of Col Romnaldo are in this neighbourhood: the gold exists in a very friable quartz-rock, traversing in veins a green stone-slate. These veins are porous, and in their cavities the gold, of about twenty-two carats fine, is disseminated and distinctly visible to the naked eye. A stream of water, at immense labour, has been conducted to the spot, which, after laying bare the different quartz-veins, rushes down the opening in the side of the hill,

and then proceeds to a shed, where it moves the stamping-mill; the quartz is placed under the stampers, and a stream of water carries off the coarser sand in one direction, while in another a number of hides secures all the lighter particles of metal. It is difficult to get a correct answer as to what the mines produce, the owners being fearful of committing themselves.

MANGE LEGUAS,—four leagues from Marianna.—The mine near this place, called Cayuba, consists of a large excavation in the side of a mountain, which is kept free from water by means of pumps, formed of a long series of wooden cogs, passing up a square trough, called a *macacu*; these pumps, in common use in all the mines, are worked both by hand and by water, and closely resemble the irrigating machines in use among the Chinese: the gold in this mine exists in combination with arsenical and iron pyrites, and disseminated yellowish oxide of bismuth, in a vein of quartz, traversing chlorite and mica-slates. The dust and small fragments of the ore are carried in bowls to the washing-trough, while the larger masses, raised by levers, after they have been separated by blowing (saw-dust in the proportion of half is mixed with the gunpowder), are conveyed to the stamping-mill, and reduced to powder. This mill consists of two stampers, armed with

iron, which descend on a stone. It is moved by water and is under cover, close to the residence of the overseer: the gold does not appear of very good quality. The establishment consists of thirty negroes, with a white overseer.

MAINARDO, Rio,—flows into the Rio Doce. There are gold-washings on this river.

OURO BRANCO (white gold), village of, situate at the foot of an extensive serro.—In this neighbourhood, looking towards Villa Rica, the search for gold is considerable, and washings are seen in every direction.

PAPA FARINHA.—Mines were opened here about 1736.

PITANGUI, one hundred miles N. of S. Joan d' El Rey, and nearly eighty W. N. W. of Sabara. A rich mine of gold occasioned here numerous disputes and deaths amongst its first dwellers, who were Paulista miners.

PARACATU DO PRINCEPE, one hundred and forty miles from S. Francisco, is a middling town, famous for its mines. The gold has a fine appearance, but, below the proper degree of purity, is of difficult extraction, for want of water; and it is not allowed to be searched for at any great distance, diamonds having been therein discovered. These mines were first worked in 1744, when their affluence in gold attracted a great concourse of people.

PARAHYBUNA, LOWER.—Searching for gold upon this part of the river is interdicted by government, under the ridiculous pretence that the quantity which the stream contains is so great, that, if extracted *ad libitum*, the value of the metal in the market would be greatly reduced; yet there is reason to believe that a very considerable quantity is procured from it, for, as the old searchers shrewdly remark, “the night has no eyes.”

The greatest collections must undoubtedly exist in the *Caldeiraos*, i. e.—those hollows which the stream has worn in the rocky bottom, and, in such situations, must be nearly free from mixture; for there the water, dashing with violence into the basin, washes the sand which it brings down out again, leaving the heavier and grosser particles at the bottom. For the same reason, the upper strata of the sand in the stiller parts of the river must contain comparatively little of the precious metal, while the lower ones are probably increasing in richness, by every circumstance which disturbs the stream. It seems that a cone of wet sand, three feet high, which requires from one man a day's labour to raise, and two days more to wash it, is expected in this part of the country to produce as much gold as is worth from twenty to twenty-five shillings.

Near the brink of one portion of the Parahy-

buna several vessels lie, which are commonly used in collecting gold-dust from the banks of the stream. By the means of a windlass and an iron scoop, the gold-washers dredge up into the canoe a part of the bed of the river, and, when they have procured as much as they can carry, they move to their washing-place, which is a kind of platform projecting over the river; the *cascalho* is then shovelled into a large trough, and upon it a stream is conducted by means of large bamboos. The canoes are very large; they are cut out of a solid piece of wood and are formed externally like a butcher's tray; their inward figure is that of a three-sided prism, one of the edges forming the line of the bottom. There are usually employed three blacks in a canoe, and two on the platform, who receive a *pataca* each (320 reis); and, as the daily gain is generally equal to 2,200, there is a balance of 600 reis for the owner of the boat. Three boats will sometimes collect five or six *oitavas* of gold (72 grains) each in the course of a day. The gold is fine-grained, and of good colour. In general, very little gold is obtained in proportion to the quantity of sand which is washed, for it is certain that the metal is not in its natural bed, but brought down thence by the current. On the other hand, the workmen cease from washing in dry weather; and, when the water is low, they

wait for another flood to bring down a fresh quantity of auriferous sand. It is evident from the whole proceedings, that the utmost ignorance prevails: a boat which takes a whole day to load, might very well be filled in three hours; and the people are so unacquainted with the effects produced by the motion of fluids upon substances which differ in their respective specific gravities, lying on the bed of the river, as to skim the surface of sands and the refuse of caldeiras in the most superficial way.

PASSAGEM,—near Marianna. In this direction is a spot on the brow of a hill, tending to the north, thought to have been one of the richest in metals in Brazil; and here mining has been followed on an extensive scale, as well as according to the best modes practised in South America; the mine belongs to a company with a capital of 20,000 cruzados, and the establishment consists of three overseers and thirty-eight negroes. Hitherto, however, it has merely paid its expenses. To the mill in use here are nine stampers, which reduce the ore to a coarse powder: it is then removed and levigated between two horizontal plates of iron, all worked by water. It is intended to erect a furnace to roast the ore, as it is thought that the gold in some instances exists in a state of chymical combination:

behind the *engenho*, the forge and the houses for the overseers and the slaves are erected. The mine is about one hundred feet in depth ; the passages which have been chiselled and blown through a mica-slate, are in places extremely wet, from the cog-pumps (*macâcus*) getting deranged ; and some engineers have thought that the mine would never be kept free from water, until there was a passage worked through to the opposite side, where there is a narrow but deep valley, into which the water, having served the purposes of the mill, ultimately runs. The metaliferous veins, from six inches to one yard in width, run entirely through this part of the mountain ; they consist of quartz, containing short, arsenical and iron pyrites, gold and arseniate of cobalt ; for these substances the miners have their peculiar names. They imagine the arsenical pyrites to be formed of lead, and call it as such. The vein is conveyed to the mill in bowls on the heads of negroes.

On the road between Passagem and Villa Rica are seen many cavities hewn in the rock, which show the construction of the veins (*filões*) or nests (*pamellas*) of white quartz, from which thousands of crusados have been extracted. The very massive formation of the quartzy mica-slate is incumbent on clay-slate, which, accord-

ing to its appearance where it stands out in the lowest parts of the valley of *Oiro Preto*, seems to form the basis of the morro, and to rest on gneiss, which is found basking out at *Caxoeira*, two leagues from Villa Rica. The kind of rocks here described, are not uniformly spread over the Morro de Villa Rica, but have different thicknesses; their general direction is in hour three of the miner's compass, and their inclination in an angle from 50° to 70° to the east.

PEIXE, RIO DE,—flows into the Rio Grande, and passes near the Fazenda San Fé. It is said formerly to have yielded much gold.

PIRANGA,—twenty miles S. E. of Villa Rica, on the San Iozé, near the Rio Doce. Here are gold-washings.

QUELUZ,—on the Paraspeba River, has gold-washings.

QUATRO, RIO DE,—near Villa do Principe, has gold-washings.

RIBEIRAO DE OIRO PRETO.—Negroes are constantly employed in this quarter for gold-washings.

REY, ST. JOAN D'EL.—The individual mine whence more particularly such masses of wealth have been extracted, and such treasures powered into Portugal, as astonished every other kingdom of Europe, is situate within the town of this name, very near to the government house;

it is nothing more than a deep pit with perpendicular sides, about twenty-five feet over and nearly round, formed in a whitish sort of sandstone, which contains some pyrites. Its situation is, as it were, in the focus of the hills which rise behind it, and form the *Serro* of *Lenheiro*. The waters in the rainy season, descending from these heights, congregate and centre in this pit. Artificial channels are also cut in various directions, and some of them to a great distance, to convey to the same spot waters which would not naturally find their way thither. Thus, by nature and art the pit is filled, when rain falls by the superficial waters, and the surplus passes over the northern brink, where it has worn some rough and irregular channels, and, after flowing little more than one hundred yards down the side of a steep declivity, attains the level of the adjacent river. At some periods, all the channels of this natural storehouse of treasures are dry, and the stagnant water, of a dirty green colour, does not rise to within ten feet of the brink. This reservoir is said to be common property—a source whence any one may extract what he can find. During the dry season, therefore, a number of people sometimes determine to set slaves to work with chain-pumps, to draw out as much of the water as they can, and then grope in the hollows of the uneven bottom for the

metal which it may contain. On such occasions, it is soon found that there is evidently some communication with the interior waters of the mountain ; for, if the labour be intermitted, the water in the pit returns to its usual elevation. This circumstance perpetually deters the people from commencing such operations, because they are always expensive, and may be unavailing. A general opinion is entertained that the waters of the mine are connected with those of the river, and that it is necessary to exhaust the one before the other can be free. It is in vain to observe against this hypothesis, that the surface of the water in the pit is, at least, fifty feet above that of the river ; that this circumstance clearly proves that no subterranean communication exists between them ; and that, if there were one, the mine would naturally drain itself. Equally vain is it to speak of easier and completer methods of exhausting the water, either by cutting down the front of the pit facing the river, by perforating the hill near the bottom, where the drain would not be more than one hundred yards long, by the use of syphons, for which the form of the hill is admirably adapted ; or by placing a platform over the water, and using dumb-rakes in the form of spoons for collecting the gold dust ; which, indeed, appears the most feasible mode : but to whatever improve-

ment is suggested, the people are always satisfied in remarking, "that the English have extraordinary methods of doing things, which Brazilians do not understand."

West of St. John, some of the poorer sorts of people employ themselves in the broad shallows of the river, collecting the *cascalho*, or rounded pieces of quartz, which the stream brings down, breaking them, examining the fragments, and washing them in a bowl, in order to discover and extract any portion of the precious metals which they may contain. Others take up the mere sand from the bed of the river, and wash it for the same purpose, while others again dig a hole in the stream, or else divert the current into one, prepared on its brink. When the hollow is filled with fresh sand, they take it out, submit it to the same petty process, and call this mining. Still further, in the same direction, is a considerable work, extending over several acres of ground, established on the same vein, but conducted in a different mode; it is formed on the declivity of a gentle hill, and rises only a few yards above the neighbouring meadows. The soil is composed of red clay, in which is imbedded a large quantity of quartz, which appears to have been subjected to some degree of friction; but not enough to give it that form which is generally denominated rounded. The

crown and face of the hillock are cut into trenches, with perpendicular sides, about two feet deep, eighteen inches wide, and as many distant from each other. Into these a stream of water is conducted, which, separating the clay from the stone, and carrying it off to the lower ground, leaves the pebbles in the trenches. These are taken out and carefully examined, broken into fragments where there is any appearance of advantage, and washed in the bowls as before. Works of this kind are sometimes conducted upon a very extensive scale, and they are called, as has been stated, *Lavras de talha aberta*.

SAN JOSE,*—rivulet, two leagues from St. Joan d'El Rey. It abounds in gold-washings, some of which continue good.

SAN JOZE DE BARRA LONGA,—E. of Villa Rica. In this quarter gold abounds.

TAMANDUA,—ninety miles W. of Villa Rica, fifty N. W. of St. Joan, seventy S. of Pitangui, and seventy N. W. of Sabara. There are mines in this direction.

TEJUCO—has several gold-washings.

TAPINHACANGA,—near Villa do Principe, possesses many gold-washings in its vicinity.

* There are several rivulets in various parts that bear this name.

VILLA DO PRINCIPE,—one hundred miles N. E. of Sabara, one hundred and ten N. N. E. of Mariana, and three hundred and seventy N. W. of Rio de Janeiro. The inhabitants are in great part miners. At a washing about six leagues distant from this place, a lump of gold was once found of several pounds weight.

VILLA DA PRINCESA DA BEIRA,—formerly *Campanha*, eighty miles S. W. of St. Joan, one hundred and fifty S. of Pitangui, and four leagues to the N. W. of Gonzalo. The gold mines in the neighbourhood, some of which have been worked only a few years, are among the richest now in Brazil; the trenches, by which the water required is led from the highest parts of the country, are often of surprising extent, and run for leagues along the declivities of the mountains. Here, too, the mountains consist of granite: here and there veins of quartz traverse the rock in manifold directions, and these always abound in disseminated gold. The miners, however, do not look for and follow them, except when the surrounding rock is so entirely disintegrated that it yields the profit they seek, without being worked according to the proper rules of the art of mining.

VILLA RICA,—on the Oiro Preto or Do Carmo. The eastern declivity of the *Morro de Villo Poca* has hitherto yielded the greatest

abundance of gold, and the mine belonging to Col. Velozo is one of the oldest and most productive.

To contemplate the mines in this part of the country with advantage, it will be necessary to recollect that the land is composed of *schist*, or a sort of slaty clay, resting upon a core of granite, gneiss, or sand-stone, sometimes laminated, at others solid, the gold being scattered in small particles, amidst the adjacent schist and clay; and that the town is placed at the junction of several streams, whose waters have only one outlet, by a narrow chasm, cut by their force through the surface down to the more firm component parts. Before this outlet, called the *Rio do Carmo*, became so deep as it is, a small lake must have existed among the hills, through which all the waters of the upper country passed, bringing with them and depositing in the bottom a variety of heavy matter. Thus the ground seems to have been gradually raised, while the outlet was deepened, until the water was entirely drained off, and left the bottom dry in the form of a level plain, composed of all sorts of wreck, which, from the auriferous nature of the country, contained a considerable proportion of gold, both in the form of dust, mingled with the attritured schist, and embedded in quartz, as *cascalho*. The extent of this plain is from

thirty to forty acres, and it is connected, by narrow passes, with others of a like size. The mountains surrounding this supposed ancient lake rise from seven hundred to one thousand feet above its level, and on the declivity of the most northern of them the city is built. In the sides of all of them much gold is undoubtedly still detained, notwithstanding the quantity which has been washed down or gathered from them. The comparatively small plain above mentioned may, however, be considered as the swan which, through a succession of years, has laid golden eggs for the crown of Portugal; its surface is only just even with the stream flowing through it, and after much rain it is always flooded. The whole is considered public property, and any person may cut trenches from the stream, and conduct them in any direction he pleases, provided the ground be not previously occupied by another adventurer. After the spot has been recently flooded, the inhabitants of Villa Rica are said to turn out *en masse*, to pursue with ardour the search for gold, and do not desist until the whole of the impregnated surface is completely ransacked; but in the dry season scarcely half a dozen miners are seen at work.

On the side of the hills which are steep, different methods of mining are adopted. Whenever a natural stream trickles down, its bottom

is frequently and carefully searched, particularly when the current has met with any check, for there the precious metal is commonly detained. In parts where nature has provided no water, pits are dug and planked with strong walls or stockades, through which a stream is turned from a distance: the surplus, running over the edge of the embankment, is generally received into a second pit below, sometimes into a third; at proper seasons the pits are cleared of the water; the sediment is taken out and treated in the usual way: the waters are generally saturated with red clay, and, by a repetition of these processes, the hill has been stripped of its soil as well as its verdure, wherever a stream can be conducted to carry it away. Numerous drifts also have been run, horizontally, into the softer parts of the mountain, until they entirely perforate the coating of schist or clay, and reach its solid core, while the water, oozing through the mass above, is received into basins, together with the metal which it may convey. The largest quantity is generally found to descend at the end of the shaft or drift, where the soft materials of the mountains rest against the solid ones. These drifts are seldom more than twenty yards long, five feet high, and three broad: Some of the smaller and softer hills of the vicinity have, indeed, been bored to a much greater ex-

tent, and one is completely perforated at its base. Whether large or small, these openings are closed and secured with such precautions as plainly indicate the fear of plunder.

A great quantity of the precious metal, there is little doubt, still lies buried around Villa Rica, where it must remain until better methods of mining are adopted.

When the mountains were first discovered to be auriferous, it is said that the searchers for gold did nothing more than pull up the tufts of grass from the side of the hill, and shook the precious dust from the roots. This will probably be treated as a romantic tale by all who have not examined the spot, but the fact may be easily explained: the steep slope of the mountain is covered with a coarse kind of grass or rushes, in small clumps or bunches; hence, when rain falls heavily, little streamlets or rills pass round and between the roots, and whatever of a ponderous nature they hurry downwards, must be detained wherever their rapidity is checked. This happens at every tuft of rushes which stands directly in the little water-course, and hence these roots probably become rich in metal, and, at the time of the discovery, had been undisturbed for ages; those who pulled the grass consequently would find the gold, and those who plucked a second crop would as

surely be disappointed. As these streamlets likewise descended the hill, collecting a greater quantity of water, they acquired more force, and formed for themselves, by tearing away the soil, a course with an irregular bottom, with hollows in the softer parts, which would exist in the form of basins, and the descending metal would be retained in them ; in this way the little caldeiraos were formed, which often suddenly enriched the adventurer, and of which so much is said by those who envy their good fortune.

Independently of the mountains, the streams also about Villa Rica, as they are not private property, are searched for gold. Negroes are always to be seen in the Oiro Preto, or Do Carmo, thus employed. The *faiscadores* (gold-washers) are dressed in a leathern jacket, with a round bowl, cut out of the wood of the fig-tree (*gamelleira*), from one to two feet in diameter, and one foot deep, and a leathern bag fixed before them ; they generally select those places in which the river is not rapid, where it makes a bend and has deep holes. They first remove the large stones and upper layers of sand with their feet, or their gamella, and then take up a bowlful from the deeper and older gravel of the river (*cascalho virgem*). They continue to shake, wash, and strike off the stones and sand at the top, till the heavy gold-dust appears pure at the bottom of

the vessel, on which a little water is thrown in with the hand, and the gold at length put into the leathern bag. This mode of gold-washing is here called *mergulhar*-diving. Every bowl of *cascalho*, the washing of which requires about a quarter of an hour, generally yields from one to two vintems, and a man may gain in this manner several florins in a day. Sometimes the *cascalho* is washed upon a platform (*canoa*) erected on the spot.

The canoes are made in the following manner. —Two ten or twelve inch planks, about twelve or fifteen feet in length, are laid on the ground, forming an inclined plane, sloping about one inch in twelve : two other planks of similar dimensions are fixed in the same direction at the lower end, forming a second inclined plane, with a fall of six inches from the former. On their sides are boards placed edgeways, and staked down to the ground, so as to form long shallow troughs, the bottoms of which are covered with hides, tanned with the hair on, having the hairy side outwards, or, in defect of these, with rough baize. Down these troughs is conveyed the water, containing the oxide of iron, and the lighter particles of gold ; the latter substance precipitating in its course, is estrangled by the hair. Every half hour the hides are taken up and carried to a bank near at hand, formed of four walls, say five feet long,

four broad, and four deep, and containing about two feet depth of water: the hides are stretched over this tank and well beaten, then dipped and beaten repeatedly, until all the gold is disentangled, after which they are carried back and replaced in the troughs. The tanks are locked up at night, and well secured. The sediment taken from them, being light, is easily washed away by the hand, in the manner before described, leaving only the black oxide of iron, called *esmeril*, and the gold, which is so fine that mercury is used to separate it. About two pounds' weight of oxide of iron, very rich, let it be supposed, in fine grains of gold, are put into a clean bowl, into which two ounces of mercury are also added. The mass of oxide, which is generally very damp, is worked by the hand for about twenty minutes, when the mercury separates from the *esmeril*, and takes up all the gold, assuming a soft doughy mass, that retains any form into which it is squeezed. The grains of gold, however, remain, not amalgamated with, but merely enveloped in the mercury. The mass is put into a folded handkerchief, and an ounce or more of mercury wrung or squeezed from it: the rest is placed into a small brass dish, covered with a few green leaves, and then placed over a charcoal fire, where it is stirred with an iron rod to prevent the gold from adhering to the sides of the dish. The

leaves are occasionally changed as they become parched by the heat. When taken off, they exhibit in some parts small globules of mercury, and in others white oxide. On washing them with water, nearly half an ounce of the former substance is usually obtained from them. After this operation, the gold is for the most part changed in colour, from an agreeable soft yellow, to a dirty brown, and presents a very different appearance from that which is not subjected to mercury.*

MODE OF SMELTING GOLD AT VILLA RICA.

ALL the gold dust brought from the Comarca of Do Oiro Preto, or Villa Rica, comes first into the weighing-room, where the *Escrivão da Receita* weighs it, and separates the fifth part from it, as due to the king, and the *Escrivão da Conferencia* enters in the list the quantity of each owner, without and with the deduction. The parts belonging to the king; are thrown together, mixed, and melted into large bars; but the four parts belonging to private individuals, into single

* The government of Brazil would find it highly to their interest to promote the use of mercury in the gold district. The process of amalgamation is so simple, that there would be no difficulty in introducing it generally among miners, and it would save much time and labour in the last operation of washing, or what is called purifying.

smaller bars. For this purpose the gold-dust is put into a crucible of proportionate size, and, as soon as it begins to melt, it is kept there for some time with sublimate of mercury. When it appears to be perfectly melted, the metal is poured into a square iron mould, furnished with handles, in which it cools. These moulds are of very different sizes, containing from ten oitavas to an arroba of gold. The various combinations of the gold to be melted with iron, antimony, manganese, or arsenic, determine the time necessary to melt it. Gold which is more difficult to melt is mixed with a greater proportion of sublimate; this is particularly the case with that with which much iron is mingled; the workmen, by long experience, generally know the quantity of the addition which the gold of such mines requires. Very pure gold is perfectly melted in three hours. The colour of the gold smelted at Villa Rica is of very different hues from the most beautiful gold-yellow to reddish copper colour, bright yellow, and even grey-yellow—a specimen of every shade is preserved. The gold bar when cut, comes into the hands of the assayer (*ensayador*), who determines the weight and fineness by the trial with sublimate:—for this purpose, he takes a piece from one end of the bar, and in difficult cases from both. In bars from well-known mines, the trial is made only with the touchstone, for which are kept, on copper

pins, the specimens from sixteen to twenty-four carats (*quilates*), each of which is divided into eight equal parts. The purest gold smelted at Villa Rica is of twenty-three carats and seven-eighths. The mines of Villa Rica generally produce gold from twenty to twenty-three carats : those of Sabará and Congonhas de Sabará, from eighteen to nineteen carats ; that from the Rio das Velhas near Sabará, gives from nineteen to twenty. The gold of Cocaës and Inficionado is very pure, though not of a very fine yellow, but often pale or copper-coloured. When the weight and fineness, and, consequently, the value of the bar, are determined and entered in the list, the Brazilian arms, the number of the list, the mark of the smelting-house, the date of the year, and the degree of fineness, are stamped upon it, and a printed ticket is given with the bar, which, besides all the above particulars, states the value in rees, the weight which the proprietor gave in gold-dust, and how much was deducted for the king. Without this instrument, signed by the officers of the smelting-house, the bar, which is returned to the owner, cannot legally pass instead of coin. It is strictly prohibited to export it from the province of Minas, without notice ; because the royal mints are to re-purchase the bars, for their nominal value in ready money. But, as an agio of ten per cent. is offered for the bars

even on the coasts of Brazil, this species of fraud is very common.

MINES OF JARAGUA.*

THE mode of working these mines, more fitly to be denominated washings, is simple, and may be easily explained.

Suppose a loose gravel like stratum of rounded quartzose pebbles and adventitious matter, incumbent on granite, and covered by earthy matter of variable thickness. Where water of sufficient high level can be commanded, the ground is cut in steps, each twenty or thirty feet wide, two or three broad, and about one deep. Near the bottom, a trench is cut to the depth of two or three feet: on each step stand six or eight negroes, who, as the water flows gently from above, keep the earth continually in motion with shovels, until the whole is reduced to liquid mud, and washed below. The particles of gold contained in this earth, descend to the trench, where, by reason of their specific gravity, they quickly pre-

* The mines of Jaragua are thirty miles from S. Paulo. There may be some slight repetition touching a few particulars in my inserting here a description of the mode employed for working them; but the interest of the subject will be my apology.

cipitate. Workmen are continually employed at the trench to remove the stones, and clear away the surface, which operation is much assisted by the current of water which falls into it. After a few days washing, the precipitation in the trench is carried to some convenient stream, to undergo a second clearance. For this purpose wooden bowls are provided, of a funnel shape, about two feet wide at the mouth, and five or six inches deep, called *gamellas*. Each workman, standing in the stream, takes into his bowl five or six pounds weight of the sediment, which generally consists of heavy matter, such as granular oxide of iron, pyrites, ferruginous quartz, and often precious stones. They admit certain quantities of water into the bowls, which they move about so dexterously, that the precious metal, separating from the inferior and lighter substances, settles to the bottom and sides of the vessel. They then rinse their bowls in a larger vessel of clean water, leaving the gold in it, and begin again. The washing of each bowlful occupies from five to eight or nine minutes; the gold produced is extremely variable in quantity, and in the size of its particles, some of which are so minute, that they float,* while others are found

* To prevent any loss which might occur from this circumstance, the negroes bruise a few handfuls of herbs on a stone,

as large as peas, and not unfrequently much larger. This operation is superintended by overseers, as the result is of considerable importance. When the whole is finished, the gold is placed upon a brass pan, over a slow fire, to be dried, and at a convenient time is taken to the Permutation Office, where it is weighed, and a fifth is reserved for the crown. The remainder is smelted with muriate of mercury, then cast into ingots, assayed, and stamped according to its intrinsic value.

MEANS EMPLOYED FOR DRAWING OFF WATER FROM PITS.

THE hydraulic machines employed for the purpose are constructed as follows:—

A trough or spout, made of four stout planks, forming a trunk about six inches square, is placed in an inclined position, with its lower end in the pit, where a roller is properly secured

and mix the juice, in small proportions, with the water in their gamellas. Whether this liquid in reality tends to precipitate the gold, remains yet to be proved, but the negroes certainly use it with the greatest confidence. There are several plants in common use for the purpose, but the one generally preferred, from its containing more juice, is called *itambamba*, the leaves of which have a bitter taste and gummy feel.

L

to a pile driven in the ground; an iron chain with peculiar links, in every one of which is fixed a piece of wood, nearly answering the interior dimensions of the spout, is passed through it, then under the roller and over the outside, up to the axis of a water-wheel, which, being put in motion, causes the discharge of a column of water equal to the cavity. These machines are calculated to raise a great deal of water, but they are liable to be thrown out of repair; in many cases, hand-pumps would serve the purpose better, being made at little trouble or expense, easily repaired, and always ready, at an hour's notice. They are in Minas Geraës utterly unknown.

MODE SUGGESTED FOR WASHING CASCALHO.

THE tedious process of washing the *cascalho* in *gamellas* might be much shortened by using a machine of very easy construction: suppose a cylinder, to be formed of bars of iron, longitudinally placed, and nailed to circles of wood, open at each end, and suspended on two centres, one about sixteen inches higher than the other. At the highest end the *cascalho* is to enter, by being put into a hopper which communicates with

it; the bars must be nailed almost close to each other at the upper end, gradually widening to the lower end, where they should be almost half an inch asunder. The cylinder ought to be from ten to twelve feet long, and a stream of water conducted to fall upon it lengthwise; it should be enclosed like a dressing-machine in a flour-mill, and be subjected to a very quick motion. The portion of *cascalho* containing the most gold will fall through near the upper end, the other parts, according to their comparative fineness, gradually descending, until nothing but the pebbles fall out at the lower end; the earth, &c. falling into partitions or troughs, below the cylinder, would be ready for being separated from the gold by hand, which might be done with very little trouble. Machines of this kind might be made on any scale, and, if generally known and adopted, would save the labour of the negroes in a tenfold degree. There was one constructing in 1808, in *Cerro de Frio* (Diamond District), which, if properly finished, would do more work than one hundred negroes in any given time. A further improvement might be made, too, to this useful apparatus; for, if the gold washed from the machine were to fall upon troughs placed in an inclined position, having a channel across about a yard from the up-

per end*, all the gold would precipitate into it ; and, if a negro were to be continually employed in agitating the water, the earthy matter would run off, leaving only the gold and the ferruginous particles, which might be separated by mercury.

MILLS.

MILLS, composed of three heavy irregular stones, resembling English flint-mills, would reduce many of the ferruginous aggregates, and softer substances which contain gold. The matter thus reduced might be immediately washed by falling or being put into the inclined planes already described, and would, no doubt, prove the means of obtaining considerable quantities of the precious metal which would be otherwise lost. *Stamps* might be useful where gold is found in hard and brittle substances, but these would be more effectually pulverized by a heavy stone rolling upon its edge, not unlike a tanner's bark-mill.

A German baron has lately erected, near Villa Rica, a water-mill, for the purpose of breaking

* If necessary, another channel might be made, at a convenient distance from the first.

and washing the *cascalho*. One part of the machine breaks the quartz by means of stampers, working like those of English oil-mills; the other consists of two large vats, like those of a brewhouse, into which the broken quartz is conveyed, and where it is stirred about by means of flukes affixed to the under-side of the lids, which are set in motion by a horizontal cog-wheel. A small stream of water is conducted into each vat, which, after passing through the mass of *cascalho*, escapes by a small spout fixed near the bottom of the vats, and with it issues a part of the gold. This machine is miserably finished and put together, not, however, so much from any want of the necessary knowledge and skill in the contriver, as from the utter want of dexterity in the millwrights.*

MINERS' TOOLS.

THE only miners' tools employed in Brazil, are the iron-bar and the hoe: the common miner's *pick* would in many cases be service-

* The Brazilians dislike to construct machinery, fearing that this is only part of a general plan for superseding manual labour.

able, and *bucking-irons** would reduce the matrix much more effectually than beating it with stones, which is the usual mode now practised : in many instances, also, *hand-sieves*, if not too expensive, might be found effective, and would certainly save considerable time and labour in washing.

Where the objects of pursuit are gold, it might have been expected that all the energies of the mind would have been called into action, to contrive means for facilitating labour and for profiting to the utmost by the munificence of a bountiful Creator ; yet it is true, that though an insatiable thirst after this kind of wealth has long existed, it is almost impossible for a person resident in England to conceive how ignorant the Brazilians are in respect to mechanical means of mining. It is not that the people are naturally deficient in mental powers, or even destitute of that energy which would enable them in most cases to excel ; but they have, I repeat, few or no machines, and scarcely an implement fit for carrying on any operation underground ; they have not, either, been conversant with the ob-

* *Bucking-irons* are pieces of cast-iron, with wooden handles, used at the lead mines in Britain, to break the ore from what it adheres to.

jects of experimental philosophy, nor have they, above all, been accustomed to contemplate nature, and to follow her into the dark recesses of her inexhaustible stores. Many of them consider all such knowledge and pursuits as evil, and have not yet lost their dread of conjurers and wizards.

C H A P. XII.

IMPOSITIONS.

To those who are most conversant with human nature, it will not appear extraordinary that the same cupidity which has tempted men to deceive and endeavour to overreach in the old world, should equally have exercised its influence with the less civilized, although not less avaricious inhabitants of the new.

“During my residence in Brazil,” says Mr. Luccock, “application was made to me to advance capital under these circumstances: a poor man said he knew where a mass of native gold existed, which would require extensive works to extract it, and solicited aid upon such securities as should be agreed. The treasure was represented as lying in the bed of a torrent where the water passes between immense rocks, with perpendicular faces, and just at the foot of a cataract, where the spouting fluid has worn itself a deep hollow in the rock upon which it falls. I required a proof that the treasure actually existed, and, to procure one, a black man, with a crow-bar in his hand, dived into the boiling pit; he

soon came up again, and said, that in striking at the mass he had dropped his bar. After having recovered breath, he again plunged into the foaming torrent, and brought up with him a lump of rich gold ore, as large as a small walnut. It bore two distinct marks where the bar had struck it, and had evidently been broken, or rather cut off, from a larger mass. I was not present at the time when the man dived, nor was I allowed to know precisely the spot where the treasure lay, without entering into such engagements as did not appear to me prudent. The account is given simply as I received it."

Mr. Mawe was still more grossly attempted to be imposed upon:—

"I was requested," writes he, "by the government, to repair to *Canta Gallo*, a distance of about forty leagues from Rio, to inspect some silver mines which two men reported they had found in that neighbourhood; they had brought to the mint a quantity of earthy matter reduced to powder, from which was smelted a small ingot of silver. On arriving at the place of the supposed treasure, I proceeded to examine the sand and stones of the reported mine, but no particle of metal was to be found in either. I then ordered the men to produce their samples, which I examined both by the blowpipe and by acids, but no silver appeared. After equi-

vocating much, the fellows acknowledged that they had rubbed and beaten substances to powder, and, where they found specular iron ore, they thought it was silver. In one of the samples there certainly was silver, but it appeared to have been filed, probably from an old buckle or spoon, or rubbed on a stone, and mixed with a pulverized substance. The farce could be no longer carried on ; I charged them in a most determined manner with imposture, which, after some hesitation, they confessed. An officer who was with me would have secured them, but I restrained him ; for, having obtained a confession, I was unwilling to bring them to punishment, or to render them more miserable than they already were, by having them sent to the army. Perhaps that would have been doing them a greater service than setting them at liberty, for they were too lazy to work, and would no doubt return to their old habits of prowling about and subsisting on the credulity of the public, by spreading fallacious reports about mines, &c."

Instances are by no means uncommon, in which copper or brass filings, mixed with earth and afterwards washed, have been produced as samples, in order to enhance the value of land or serve some other sinister purpose. Shining yel-

low pyrites* have often, too, been mistaken by merchants and travellers, for gold, and no place can testify better than Brazil, the errors many individuals have made, in not being able to discriminate the precious metal from foreign substances.

Shining yellow pyrites may be very readily distinguished from any other matter it may resemble, by the application of the knife or hammer. Endeavour to cut the specimen, and if it is gold it will be soft, and yield easily to the knife, like lead; or if it be struck gently with the hammer it will be indented, gold being malleable, neither of which properties are possessed by pyrites, which are, on the contrary, brittle and hard.

HOW TO DETECT GOLD-DUST THAT HAS BEEN ADULTERATED.

PLACE a little gold-dust in a glass tube or earthenware saucer, and pour nitric acid upon it; then hold the glass or saucer over a flame, or upon a few embers, until red flames (nitric vapours) arise; if it be pure gold, the liquid will not become discoloured, but if pyrites or brass

* This substance is sometimes called Mundic, Brazil, or Marcasite.

filings should have been mixed with it, the acid will become turbid, green, and black, discharging bubbles of air. After the ebullition has ceased, the residue should be washed with water, and acid again poured upon it, when the same effect may be observed, but in a less degree; and if the experiment be repeated till all effervescence ceases, it will, finally, leave the gold-dust pure.

CHAP. XIII.

PRODUCE OF THE MINES, &c. &c.

1714. SOME calculation may be formed of the quantity of gold found about this time in the captaincy of Minas Geraës, by the sum paid to the Treasury, the Governor having accepted an offer from the miners of *thirty arrobas*, in lieu of the fifths for that year, an *arroba* being about twenty-eight pounds avoirdupois weight. The government was not satisfied with this commutation, and ordered him to collect by *bateas* instead; a mode which the *camara* of St. Paulo had originally proposed, and by which, instead of taking a fifth at the smelting-house, a poll-tax of not less than *twelve oitavas* was to be paid for every negro employed in mining. The experience of a single year proved this to be as little advantageous to the Treasury as it was agreeable to the people, and the Governor, therefore, was instructed again to accept the *thirty arrobas*, or about 50,400*l.* sterling.

1719. When Silveira succeeded to the government of the province, the commutation of *thirty arrobas* was subsisting; the *camaras* collected it, and the richest settlers raised it by an assessment among themselves, according to the number of their negroes. This sum, however, the Governor considered as by no means equivalent to the value of the fifths, according to the increased and increasing produce of the mines. He therefore convoked a meeting of the *camaras* from the different towns at Villa Rica; and it was agreed that *ten arrobas* should be added. These tenths were afterwards let by auction.

1753. This was the golden age of the Portuguese Government. The fifths from Minas Geraës amounted this year to nearly 400,000*l.*; for about sixteen years the average of the fifths considerably exceeded the hundred *arrobas*; afterwards the average for eleven years declined from *one hundred and nine arrobas* to *eighty-six*.

In the space of sixty years, that is from 1694 to 1754, it has been calculated, that Brazil exported annually about 1,700,000*l.*

1789. The fifths in the captaincy of Minas Geraës, which, for many years after the capitulation was commuted, had averaged more than

one hundred *arrobas*, had for about thirty years been gradually declining, till they fell short of fifty; the people were pledged, by their own offer, to make up to the amount of one hundred, whenever the fifths might produce less. Had this been always regularly exacted, the tax would have continued to be paid, till the difficulty of collecting it, and its disproportion to the diminished produce of the mines, would have convinced the government, that it was necessary to abate the impost. It was collected till the average fell a little below ninety: but, from the death of King José, at which time the decay of the mines became more and more rapid every year, the arrears had been allowed to accumulate; till, in 1790, they amounted to the tremendous sum of seven hundred *arrobas*, which is equal to the estimated amount of all the unmined gold then circulating in that captaincy, and is more than half of all that circulated in those interior provinces where there was no other circulating medium.

The whole sum of gold extracted* from the captaincy, calculated upon the quantity regis-

* Manoel Ferreira da Camara, in his *Observações Physico Economicas acerca da Extracção do Ouro das Minas do Brazil* (an unpublished memoir read before the Academy at Lisbon),

tered and fifthed, and upon the moderate computation, that only one-fifth of the whole had been clandestinely exported, has been estimated at forty-five millions sterling.

1809. In this year the *comarca* of Villa Rica alone received for gold permuted one hundred and six *arrobas* of thirty-two pounds each; and, as the remaining *comarcas* of which the province is composed, could not be rated to permute less than from fifteen to twenty *arrobas*, the whole province might be fairly estimated to yield to government, as the annual fifths, one hundred and fifty *arrobas*. In a little more than one hundred years, according to the entries at the smelting-house of Villa Rica, that place alone has sent into circulation more than 2,000,000 of pounds, troy weight, of gold.

Looking to the period when the fifths pro-

says, "It was proved, by comparing the wrought gold which came from Brazil with the fifths, that the crown did not recover more than one-twentieth part of its due. So successfully was the contraband extraction carried on, though large seizures were sometimes made, and so carelessly was that which it did receive collected, that the assayers at Lisbon often found pieces of copper mixed with it. That the clandestine exportation was very great is certain, but there must surely be a monstrous exaggeration in this statement.

duced 300,000*l.* per annum, and adding thereto the gold exchanged with the Spaniards for silver; likewise, that which was privately brought to Europe without paying the duty (probably about half a million more); it will result, that the annual produce of the Brazilian mines was approaching two millions sterling.

TABLE

SHOWING THE QUANTITY OF GOLD WHICH IS GOT
FROM THE DIFFERENT COUNTRIES OF THE OLD
AND NEW WORLD, TAKEN ON AN AVERAGE BE-
TWEEN THE YEARS 1790 AND 1802.

OLD CONTINENT.

	<i>Kilogrammes.</i>
Siberia	1700
Africa	1500
Hungary	650
Saltzburg	75
Norway	75

Total of the Old Continent 4000

NEW CONTINENT.

North America . .	1300
South America—	
Spanish Possessions	5000
Portuguese ditto .	7500

Total of the New Continent 13,800

Grand Total 17,800 *

The kilogramme being equal to 2lb. 3oz. 5dr.
avoirdupois, the whole amount is equal to about
39,285 pounds avoirdupois.*

* Brongniart, art. ii. p. 351.

**A COMPARATIVE STATEMENT OF THE GOLD ANNUALLY
PRODUCED BY EUROPE, NORTHERN ASIA, AND
AMERICA, IN THE BEGINNING OF THE NINETEENTH
CENTURY.**

	<i>£ Sterling.</i>
Europe	185,020
Northern Asia	76,770
New Spain	229,630
New Grenada	672,500
Peru	111,530
Potosi and the Pro- vinces to the East of the Andes, for- merly included in the vice-royalty of Buenos Ayres	72,180
Chile	400,550
*Brazil	980,870
	<hr/> 2,467,260
Total	<hr/> 2,729,050 <hr/>

It follows from this table, that Brazil alone furnishes considerably above one-third of the gold of the whole quantity which South America produces.

* Mr. Caldeleugh estimates the annual gross produce of the Brazilian mines at 900,000*l*.

CHAP. XIV.

PORTUGUESE CURRENCY—WEIGHTS, MEASURES,
&c. &c.

THE Portuguese money is computed by *reis*, an imaginary coin, one thousand of which (the milrea) are equal, at par, to 5*s.* 7½*d.* British. Accounts in this money have the advantage of being kept in only one denomination.

COPPER.

				<i>s.</i>	<i>d.</i>
20 Reis	. . =	1 Vintem	. .	0	1½
40 Do.	. . =	2 Do.	. . .	0	2½

SILVER.

100 Reis	. . =	1 Testan	. . .	0	6½
160 Do.	. . =	1 Half-Pataca	. .	0	11
320 Do.	. . =	1 Pataca*	. .	1	9½
400 Do.	. . =	1 Cruzado	. .	2	3
480 Do.	. . =	1 Cruzado Novo	. .	2	8½
640 Do.	. . =	2 Patacas	. .	3	7½

* This coin is only known in Brazil.

GOLD.

		£	s.	d.
1000 Reis =	1 Milrea . .	0	5	7½
2000 Do. =	6¼ Pataca . .	0	11	3
4000 Do. =	12½ Pataca . .	1	2	0
4800 Do. =	1 Moedadeouro	1	7	0
6400 Do. =	1 Peça or piece,	1	16	0
	the half-do-			
	bloon . .			
12,800 Do. =	1 Dobloon . .	3	12	0
1,000,000 Do. =	1 Conto . .			

The Spanish dollar circulates universally in Brazil, but, by a singular custom, if paid by strangers, it passes at from 720 (4½s.) to 750 (4s. 2½d.) reis only, while its value, if received from the Portuguese, is estimated at 800 reis, or 4s. 6d. making a difference of 10 per cent. loss to foreigners.

In Minas Geraës, the money is always calculated in oitavas, each oitava being worth 1200 reis. The copper coins of Rio de Janeiro pass current with an additional value if they are stamped with an M; the piece of 40 reis then passes for 75.

Great confusion exists in Brazil respecting measures; every captaincy has its own, agreeing neither with those of its neighbours nor with the measures of Portugal, though the same

names are used invariably : thus, a *canada* and an *alqueire*, in Pernambuco, represent a much greater quantity than the same denominations in Portugal, and less than in some of the other provinces of Brazil.

GENERAL TABLE.

WEIGHTS.

1 Oitava . . .	=	$1\frac{1}{16}$ drachm avoirdupois.
8 Do.	=	1 Onça.
16 Onças . . .	=	1 Arratel.
32 Arratees . .	=	1 Arroba.
2 Arrobas . . .	=	1 Quintal.

DRY MEASURE.

1 Alqueire	=	$1\frac{1}{2}$ Peck.
4 Alqueires	=	1 Fanega.
15 Fanegas	=	1 Moio.

LONG MEASURE.

1 Polegada, or thumb-breadth, is the 12th part of a geometrical foot.

8 Polegadas	=	1 Palmo.
3 Palmos	=	1 Covado.
5 Palmos	=	1 Vara.
10 Palmos	=	1 Braça.

In Minas Geraës, accounts relating to gold are kept in marks, ounces, oitavas, and vintems; twelve vintems being equal to one oitava or eighth part of an ounce, and eight ounces to one mark,—the integral weight, or ounce of the metal, when pure; or twenty-four carats fine; and, when the royal claim, or fifth, has been satisfied, is estimated at $13,090\frac{1}{2}$ reis, which, at an exchange of 6*d.* per milreis, gives 3*l.* 5*s.* 5½*d.* nearly, as the sterling value of fine gold when issued from the smelting-house, or for British standard gold, which is only twenty-two carats fine less than 3*l.* sterling per ounce.* The relative value of every quality of gold may be easily found by multiplying the number of carats by seventy-five, or otherwise, at one operation, by using as a multiplier the number 1,309,166, which gives the product in British farthings. Hence it is evident that the intrinsic value of gold, when taken from the earth, and without any duty being paid upon it, is something less than forty-eight shillings per ounce for

* Pure gold in England is reckoned that which by the assay is found to be twenty-four carats fine, though it is no easy matter to refine it to so great perfection, and that which is less pure, as the English standard gold of twenty-two carats fine, is so many parts of twenty-four pure fine gold, and the remaining two twenty-fourths are alloy. What is said to be eighteen, nineteen, twenty, or twenty-one carats fine, is so many parts

British standard, or that quality which is twenty-two carats fine.

This is the rate at which gold is delivered into the treasury at Rio de Janeiro, where it is coined and re-issued, either in pieces of 6,400 reis each, or 4000 reis each ; the former yielding to the treasury, at the exchange already quoted, a fraction more than 75*s.* 9½*d.* and the latter a trifle less than 84*s.* 5½*d.* It may be proper to add, for the sake of those who may wish to verify these calculations, that both coins are issued at the standard quality of twenty-two carats ; that one of the pieces ought to weigh nine pennyweights and five grains, and the other, five pennyweight and four grains ; but late coinages of both these pieces are too light.

in twenty-four fine gold, and the remaining part that makes up the twenty-four is alloy.

A pound carat is thus divided :—

12 ounces	= 24 Carats
4 grains	= 1 carat
4 quarters	= 1 grain
10 pennyweights, troy	= 1 carat
2 pennyweights 12 grains, troy	= 1 grain
15 grains, troy	= 1 quarter-grain

An ounce carat is thus divided :—

1 ounce troy	= 24 carats
4 grains	= 1 carat
4 quarters	= 1 grain
20 grains, troy	= 1 carat
5 grains, troy	= 1 carat grain

PAPER CURRENCY.

BANK.—The *Caza de Fundiçam*, at St. John d'El Rey, with the other smelting-houses of Minas Geraës, act as banks to the province. Here government notes, payable on demand, are issued for sums as low as one shilling ; but their appearance, paper, and engraving, are so wretched, as to be little better than our turnpike-tickets, and forgeries consequently abound. Accounts respecting the notes are kept in reis and milreis, but the sums for which they are issued are adapted to the *pataca* of three hundred and twenty reis each, and a copper vintem is issued of forty reis, instead of twenty, its value in other provinces. The vintem of gold is equal in value to six grains in weight of the metal when pure. At the present day Minas Geraës is deluged with paper money.

On the river *Parahybuna* is a register, where officers are employed in weighing gold-dust, which they receive from a number of country people, who transfer to them the produce of their washings. These individuals, whenever they have collected a few *oitavas* of metal, bring it to the register, where it is examined, weighed, and a small sum advanced upon it. These circumstances are entered in a book ; the dust, wrapped

in a small packet, is deposited in an iron chest, and the owners depart to search for more. Whenever any one has collected as much as he thinks will make a bar, a certificate is given to him of the gross weight and probable value: the metal itself is sent to the smelting-house. In the meantime, this written certificate is negotiated by the searcher, and circulates until the bar it represents be inquired for, which is sometimes two years or more. Whenever a certificate for a bar is produced at the smelting-house, it is forthwith brought forward, and with it a voucher of the gross weight of the dust. The former of these certificates, it is evident, becomes actually a paper currency, and, on a small scale, produces in commerce some of the same effects; the latter, also, though in the present mode it rather incumbers the circulation, might be made a very convenient kind of bank-note, payable on demand, by the bar which it represents, or exchangeable for treasury paper after date.

Specie in Brazil is prohibited from being carried coastwise. Merchants who wish to deposit cash in one of the northern ports, are forced to take the bills of the Rio Bank, and pay a premium for them, varying from three to five per cent.

BANKRUPT LAWS.—By a late regulation, imprisonment for debt is prohibited, except when

the creditors can prove a fraud on the part of the debtor ; in which case he is condemned to perpetual imprisonment, unless either the injured party relents, or the debtor is enabled to satisfy the demands against him.

When a bankrupt delivers up his effects, they are sold and divided among his creditors, who have no further claim upon him ; but, if he either neglects or refuses to do this, the law empowers them to seize everything he may possess, and, in this case, they still continue to have a claim on whatever property he may acquire, till the whole debt is liquidated.

The emperor, when prince regent, passed laws on the 24th of September, 1814, and the 16th of February, 1816, conceding to the bank at Rio certain preferences, and, by a decree of the 29th of November, 1818, he granted them the full privilege, in cases of insolvency, of a first and distinct claim, before all other creditors. Much cannot be urged for the policy or justice of these laws, and, like many others affecting trade in this quarter of the globe, they require revision.

INTEREST.—The legal interest in Brazil is six per cent. ; but money can seldom be obtained under twelve, and not unfrequently fifteen per cent.

LOAN.—A loan was contracted in London for

Brazil, in 1824: the capital is £3,200,000 money, bearing 5 per cent. interest;—it came out at 75 per cent., and the dividends are payable on the 1st of April and 1st of October.

APPENDIX.

PACKETS.

THE station of H. M. packets for Brazil, is Falmouth; they are six in number:—

	CAPTAINS.
Lord Melville,	Fuze
H. M. B. Emulous,	Croke
Duke of York,	Price
H. M. B. Goldfinch,	Walkie
H. M. B. Kingfisher,	Henderson
H. M. B. Zephyr,	Church

The first Tuesday in each month is, weather favourable, the day of sailing, and the voyage out and return is calculated by the General Post Office, at twenty weeks.

From July to December inclusive, the packets touch at Pernambuco and Bahia, in their outward passage to Rio de Janeiro, and the other six months on their homeward.

The charge by H. M. packets is 73*l.* for a cabin passenger, and 36*l.* for a steerage from Falmouth to Brazil; and the return to Europe from this part of South America is 80*l.* for the former, and 40*l.* for the latter.

Female servants pay as cabin passengers. Men-servants accompanying their masters pay

as steerage. Children, under twelve months, go free of charge—under four years, pay as steerage—above four years, as cabin passengers.

Each person provides his or her own bedding, and is allowed to carry any weight of linen, wearing apparel, and books, not exceeding four hundred pounds.

Individuals not proceeding after engaging for their conveyance forfeit half the passage-money.

Any commander of a packet demanding more than the authorized rates, incurs the risk of the high displeasure of the Lords Commissioners of the Admiralty.

**TREATY OF COMMERCE AND NAVIGATION BETWEEN
GREAT BRITAIN AND BRAZIL, SIGNED AT RIO DE
JANEIRO, 19th FEBRUARY, 1810.**

THIS treaty was to take effect from the date of H. B. Majesty's ratification thereof: the mutual exchange to be completed in London, within four months, or sooner if possible.

British goods to pay a duty on importation to Brazil of fifteen per cent.*

* British merchants labour under some inconvenience, originating in the misconstruction of or noncompliance with the actual intent of the convention for regulating the levying of the 15 per cent. duty upon that portion of English goods, not

British subjects resident in the Portuguese dominions, shall be permitted to nominate special magistrates to act for them as Judges *Conservator*.*

embraced by the *pauta*, and which latter instrument is additionally and injuriously partial in its operations, not being a fair standard by which the real value of the article the duty is to be paid upon can be designated. The avowed object between the two governments in this arrangement is that the British merchant shall pay a duty of 15 per cent. upon the fair value of the thing imported; but the *pauta* enumerates a fixed value upon certain articles, without reference to the fluctuation of price; and the tide having uniformly of late years flowed downwards, in this respect goods have experienced a diminution from the average valuation of that instrument; consequently, the duty may amount to twenty-five or thirty per cent. in place of fifteen upon their actual worth; nor is this the only mischief to which the *pauta* gives rise, and there is no one regulation which calls more than this one for interference on the part of the British government.

* It would be well if the decisions of these conservators were somewhat more attended to than they are. At Rio the appointment of an English judge conservator, who is, indeed, a respectable man, and disposed to act with promptitude and justice, appears to be perfectly nugatory in cases of importance; although his decisions may have some influence with the other courts, they are by no means final or effectual, and the same delay takes place under such circumstances as if the office did not exist. The privilege of having a judge, whose salary of 500*l.* a year is paid out of the contribution fund, would appear to be conceded to the English without its producing any adequate advantage to them.

Generally, all the privileges hitherto granted unto British subjects are confirmed.*

* The following is a concise account of them—

Don Joam, &c. “ Be it known, that A. B. declares himself to be a merchant resident in this city (* * *) and a subject of H. B. M. and therefore competent to enjoy all the privileges and immunities which have been conceded to British subjects, &c. The merchant of that nation may freely trade, contract, buy and sell, in all these kingdoms and lordships, &c. and, where a doubt arises concerning any business with them, this shall be construed rather with a bias in their favour than against them. British subjects can only be arrested and confined in their own houses, according to their rank in life, or in the castle of * * *; and these arrests cannot be carried into execution by bailiffs (*homems de l'ara*), but only by the *alcaide*. They are exempted from the payment of certain duties upon those articles which they can prove to be for the use of their own families. They cannot be obliged to give up their houses or warehouses, against their consent. They cannot be obliged to serve as guardians, and they are exempted from certain imposts; they may carry offensive and defensive arms by day and by night, with or without a light, taking care not to do with them what they ought not to do.”

Here follow penalties to which those officers will be subjected who do not pay a due regard to these privileges. The clerks and servants of Englishmen enjoy the same privileges, to the number of six, provided they are not Spaniards.

British subjects are not liable to the jurisdiction of the *Juiz de Orfaons* and *Auzentes*, into whose hands the property of orphans fall, and of those persons who die without heirs, resident upon the spot, and from whom it is difficult to reclaim what has once found its way into this office.

Finally. The two high contracting parties reserve to themselves the right of jointly examining and revising the several articles of this treaty, at the expiration of fifteen years, counted, in the first instance, from the date of the exchange of the ratification thereof, and of their proposing, discussing, and making such amendments or additions, as the real interests of their respective subjects may seem to require. It being understood that any stipulation which, at the period of revision of the treaty, shall be objected to, by either of the high contracting parties, shall be considered as suspended in its operation, until the discussion concerning that stipulation shall be terminated ; due notice being previously given to the other contracting party of the intended suspension of such stipulation, for the purpose of avoiding mutual inconvenience.

It would appear by this treaty, that it cannot be strictly said to have expired, but that it is only at present subject to the *revision* and *examination* of the contracting parties. What changes the separation which has occurred between Portugal and her colonies may produce in the commercial relations of Britain with the new

state of Brazil, it would be idle at present to surmise ; since the mission which Sir Charles Stewart has just entered upon will, in all probability, in a short period set this matter finally at rest, between the courts of Rio and St. James.

DESCRIPTION OF A MACHINE FOR ROOTING UP THE
STUMPS OF TREES, BY CITIZEN SAINT VICTOR, MEM-
BER OF THE SOCIETY OF AGRICULTURE FOR THE
DEPT. OF THE SEINE.

THIS machine consists of a bar of forged iron, about two feet eight inches long, one inch thick towards the handle, and of two inches towards the breech, or platform. The platform, which is circular, is fourteen inches in diameter. This platform serves as the base of the chamber, or furnace of the mine, which is three inches in diameter, and three inches eight lines in the length of its bore. The stopper, or tampion, which serves as a plug to the mine, is of the same diameter, to enter within, after a slight paper or wadding. It is attached by a chain to the gun or mortar, which last is eight inches in diameter. About two inches above, is added a small touch-hole and pan. The hole is directed in an angle of forty-five degrees, and is primed with powder, to communicate with the charge, with which

the chamber is filled up to the stopper. This engine may be cast even with more facility in brass or bronze, and, in this case, it must be a little thicker in all its dimensions, in order to afford a resistance equal to that of the forged iron.

USE OF THE MACHINE.

When the machine is charged with powder, a small excavation is made with a pick-axe, in the centre of the stump. The machine is then placed in it, so that the plug immediately touches the wood. Care must be taken to fill all the vacancies, either with stones, or pieces of iron, or wood, more especially beneath the platform of the machine, in order that the explosion of the powder may have its full effect on the stump, of which, if necessary, the principal roots should first be cut, if any appear on the surface of the ground near the stump that is to be eradicated. When the machine is firmly fixed in its place, the priming is put into the pan, and a slow match applied, the length of which is sufficient to allow time to retire to a proper distance from the explosion.

WORKS WHICH HAVE BEEN CONSULTED, AND FROM WHICH THE PRESENT SELECTIONS HAVE BEEN MADE.

HISTORY of Brazil. By Robert Southey.

Notes on Rio de Janeiro, and the Southern Parts of Brazil, taken during a Residence of Ten Years in that Country, from 1808 to 1818. By John Luccock.

Travels in the Interior of Brazil. By John Mawe.

Travels in Brazil in 1817 and 1820. By Dr. John Bapt Von Spix, and Dr. C. F. P. Von Martius.

A History of the Brazil. By James Henderson.

Travels in South America, during 1819-20-21. By Alexander Caldcleugh.

History of Brazil. By Andrew Grant.

Narrative of a Voyage to Brazil. By Thomas Lindley.

Travels in Brazil. By Henry Koster.

Journal of a Voyage to Brazil, and Residence there, during part of the years 1821-22-3. By Maria Graham.

Travels in Brazil, in 1815, 16, and 17. By Prince Maximilian, of Wied-Neuwied.

The Modern Traveller. London, 1824.

Voyage to South America. By Don George Juan and Don Antonio de Ulloa, Captains in the Spanish Navy.

Voyages and Travels to Various Parts of the World, during 1803-4-5-6, and 7. By G. H. Von Langsdorff.

History of Paraguay. By Father Charlevoix.

A Philosophical and Political History of the Settlements and Trade of the Europeans in the East and West Indies. By the Abbé Raynal.

Travels into Chili, over the Andes, in 1820 and 1821. By Peter Schmidtmeier.

Selections from the Works of the Baron de Humboldt, relating to Mexico. By John Taylor.

Narrative of a Pedestrian Journey through Russia. By Captain J. D. Cochran, R. N.

Familiar Lessons on Geology and Mineralogy. By John Mawe.

Annals de Chimie.

Journal of Natural Philosophy. By W. Nicholson.

Encyclopædia Britannica.

Universal Dictionary of Trade and Commerce.

Annual Register, &c. &c.

SPANISH MINES.

ACCORDING to the computation of the Spanish writers, Moncada, Navarette, and Ustariz, confirmed by Helms, the traveller, Spain received from her late possessions of South America, during the two hundred and forty-eight years that succeeded their conquest, up to 1740, nine thousand millions of piastres, equal to about £1,537,500,000 sterling ; the mines of Potosi, in Peru, alone produced, during the ninety years of their being worked, 395,619,000 piastres, or about £67,353,166 sterling, —a prodigious extraction, when it is considered that metallurgy, in these countries, has hitherto been treated, not according to the principles and rules of art, but according to the adoption and practice of an ancient and blind usage.

BY THE SAME AUTHOR.

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AN

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