

THE
ACTUAL STATE
OF
THE MEXICAN MINES,
AND THE
REASONABLE EXPECTATIONS OF THE SHAREHOLDERS OF THE
ANGLO-MEXICAN MINE ASSOCIATION,
BEING THE
SUBSTANCE OF A LETTER
ADDRESSED TO
THE DIRECTORS OF THAT COMPANY;
WITH A
SUPPLEMENT,
CONTAINING
ADDITIONAL DATA, CONFIRMED BY RECENT
INTELLIGENCE FROM MEXICO;
AND AN
APPENDIX OF ORIGINAL MEXICAN DOCUMENTS.

Sir William Rouse Ball
By (SIR) WILLIAM ADAMS.

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MDCCCXXV.

Kraes
Room

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ADVERTISEMENT.

THE Writer judges it necessary to state, that in determining to publish the subjoined Letter to the Directors of the Anglo-Mexican Mine Association, so long after he addressed it to that body, that he has done so solely from his own suggestion. Indeed, he had commenced the Supplement before any of the Directors had been apprized of his intentions.

His reasons for undertaking so laborious a task, were, to afford to the public, in some degree the means of forming a judgment for themselves, and thereby of escaping a repetition of the ruinous losses, consequent on the excessive fluctuations in the prices of the Mine shares, occasioned by the inaccurate statements which appeared, about the period when he commenced his Pamphlet; and also from the circumstance, that several of his friends who had purchased Mine shares at his instance, were from panic and the want of detailed information, induced to part with them far below their intrinsic

value; while others who had bought at a high price had, for similar reasons, sold them at a considerable loss.

Actuated by these motives, the Writer feels confident that no apology will be considered necessary for his bringing before the public, in the present detailed form, the information to be found in the following pages.

LETTER,

&c.

Albemarle-Street, Sept. 3d, 1824.

TO THE DIRECTORS OF THE ANGLO-MEXICAN
MINE ASSOCIATION*.

GENTLEMEN,

The large number of the Anglo-Mexican Mine shares held by my relatives, family connexions, and by myself, exclusive of many hundreds of shares purchased at my instance and recommendation, has naturally drawn my most serious attention

* *Names of the Directors of the Association.*

Matthias Atwood, Esq., M.P.

J. H. Anderson, Esq.

David Bevan, Esq.

David Barclay, Esq.

Matthew Harrison, Esq.

Charles Herring, Esq.

George Lyall, Esq.

J. D. Powles, Esq.

Benjamin Shaw, Esq.

W. Thompson, Esq., M. P. and
Alderman.

Wm. Ward, Esq.

Auditors.

R. M. Raikes, Esq.

| Thomas Richardson, Esq.

to the subject of the Mexican Mines ; and having made myself master of the system formerly pursued in working these mines, and also ascertained the very great advantages to be obtained by substituting the system pursued in the Cornish Mines, it occurs to me that it will be satisfactory to you, to be put in possession of these data.

It may be proper for me to premise, that in conducting my inquiries, I have had recourse not only to every published source of information within my reach, but have also availed myself of much private information, derived from sources upon which the fullest reliance may be placed. I have, I believe, read almost every work which has been published in this country, upon the subject of the Mexican Mines, their management, produce, &c. I have consulted the Official Report of the Assay-Master-General (drawn up in 1820) to the Viceroy of Spain, which, besides giving the amount of the produce of the Mines of Guanaxuato for the last *hundred and eighteen years*, explains the causes of the ruin of the mine-owners, and the consequent stoppage of the working of the mines. I have also perused other official documents brought from Mexico relative to the mines ; in addition to which I have obtained much valuable information from my friends General Wavell and Dr. Mackie. General Wavell was despatched from Mexico to England by the Mexican government this time two years, and was commissioned by various mine-

owners to form contracts in Europe, to work their mines. Dr. Mackie left Mexico last October, he having lived there ten years, and being intimately acquainted with the most respectable mine-owners of Guanaxuato and Catorce, the mines of which provinces he has frequently visited, thereby possessing the most correct information collected upon the spot, with respect to all the circumstances of the mines and their produce, as well as the Mexican modes of working them.

The Purissima Conception Mine, Dr. Mackie affirms to be almost the best, if not the very best, mine in Mexico, which opinion was recently confirmed to a friend of mine in Naples, by a near relation of one of the owners of that mine.

From Baron Humboldt's *New Spain*, I have collected the most minute details relative to the Mexican modes of working the mines, and converting the ores. He gives a description of every operation pursued in Mexico, from the boring and blasting of the rock containing the metal, up to the coinage of that metal; stating also the expenses attending each operation, the number of men and horses employed, &c., as well as the general produce.

With regard to the best system of mining pursued in this country, I have ascertained the modes of conducting the various mining and smelting operations in Cornwall, and the price of labour there, from my friend Mr. Moyle, a very experienced practical mining engineer, whose father and uncle

were most extensively engaged in the tin trade, as well as in the mines of Cornwall, and the latter of whom is well known to be one of the best assay-masters in that county; another uncle was the celebrated mining-engineer, Hornblower, and under these different gentlemen, Mr. Moyle was brought up and educated in the several departments of smelting, mining, and engineering. Possessing then these data, I feel confident that I have succeeded (although certainly at a great sacrifice of time and labour) in obtaining substantial information, upon which a solid judgment may be formed, with regard to the probable returns to be derived from working the mines of Mexico.

The Baron Humboldt affirms, in the third volume of his work on New Spain, "that the mines of Guanaxuato exceed in richness all that have hitherto been discovered in the world." The Baron states that they produced *more than one-fourth* of the silver raised in Mexico, and *one-sixth* of all that raised in America.

As the produce of Mexico, including the silver smuggled, is estimated at 40,000,000 of Dollars per annum, it therefore follows, that the mines of Guanaxuato produced upwards of 2,000,000*l.* sterling annually. The Baron, who was bred a miner, and conducted extensive mine operations in Germany for several years, further asserts, from his own observation, as well as upon the authority of a Report of the Deputies of the Body of Miners, sent to the

King of Spain some years since (in 1774), that whenever the mines should be scientifically worked, they would become *three times* more productive than heretofore.

It was the established practice of the Mexican miners, weekly to sell their ores by auction at the pit's mouth to the smelter or amalgamator, whose profit, it is said, equalled that of the miner, notwithstanding the enormous expenses incurred by the former in converting the ores, amounting to between 25 and 30 per cent. of the silver produced.

To give the amalgamator this advantage, the ores must have been sold at scarcely more than one-half their intrinsic value. The Association has therefore acted most judiciously, in determining themselves to convert the ores, instead of selling them; not only on this account, but also from the important fact ascertained by Mr. Moyle, namely, that the expenses of spalling, stamping, dressing, and smelting will not exceed 2*l.* 10*s.* the ton of raw ore, by following the Cornish system, if the price of labour in Mexico and Cornwall be the same*.

Now the poorest ores of the Valenciana Mine average *four ounces* of silver per cwt., or *eighty ounces*

	£.	s.	d.
* Spalling, 1 <i>s.</i> ; Stamping, 1 <i>s.</i> 6 <i>d.</i> ; Dressing, 6 <i>s.</i> 6 <i>d.</i>	0	9	0
Smelting 10 cwt. of dressed ores, they produce, (say, of ton of raw ores, at 4 <i>l.</i> 2 <i>s.</i> per ton.) :	2	1	0
	<hr style="width: 100%;"/>		
	£2	10	0
	<hr style="width: 100%;"/>		

per ton, which silver being estimated at 4s. 6d. the ounce, makes the produce of a ton of these ores worth 18*l.* ; while the expense of the mining operations of breaking and raising them, would amount in Cornwall to 1*l.* 10s. *per ton*. Thus, then, if we except the salaries of the agents (for the expenses of the machinery and its conveyance to the mines will be paid out of the advances to the mine owners, as arranged by contract,) a net profit of 12*l.* 16s. 7d. will be afforded by every ton of this ore so raised and smelted.

Of these poor ores very large quantities were raised from the Valenciana Mine, amounting, it is conjectured, from *three hundred* to *four hundred* tons daily, for by 1200 of the 3100 men employed in the mine, were bored and blasted *nearly* 600 holes, of four feet eleven inches deep, every twenty-four hours.

Baron Humboldt affirms, that the expenses of working the Valenciana Mine increased between 1794 and 1802, from 89,694*l.* to 194,708*l.* Supposing then that 194,000*l.* were expended in raising ores at 1*l.* 10s. *per ton*, the produce would be 129,333 tons, and supposing the ores thus raised to be of the *poorest* quality in the Valenciana Mine, namely, *eighty ounces* the ton, the value of the silver would amount to 2,327,994*l.* ; while the expenses of blasting, lifting, stamping, dressing, washing, smelting, duty, &c. would amount to 668,651*l.* 12s. leaving as net profit the ENORMOUS SUM of 1,659,342*l.* 8s. !!

The above calculations being made according to the estimate recently sent me by Mr. Moyle.

Mr. Moyle thus writes me—"The difficulty I have had to contend with in preparing an answer to your question, arose from not being able to obtain an average of the expense of dressing the tin ores of this county, which vary from two shillings per ton to twenty shillings, and then to form a sort of average estimate of the ores from Mexico. This, after several attempts, I found impracticable; but at last I found that the tin ore from a mine in this neighbourhood (Truro) resembled that from Valenciana so much, that out of four persons whom I employed to pulverize it, not one of them could tell blind-fold, which was Cornish or which Mexican. This ore when smelted produced 90lb. of tin per ton, and contained copper and iron and other substances, so as to render the method of dressing as well as stamping so much alike, that I thought I could not be far from truth, if I took the expenses of this ore as a fair criterion on which to found an estimate of the expenses for dressing and stamping the Mexican ore; and I am inclined to believe that the following debtor and creditor account will be found to be nearly correct:—

“ DR.	£. s. d.	CR.
To breaking and raising ten tons of ore at 1 <i>l.</i> 10 <i>s.</i> per ton - -	15 0 0	By 800 oz. of silver the quantity produced from 10 tons of raw ores, at the average produce of 4 oz. per cwt. rated at 4 <i>s.</i> 6 <i>d.</i> per oz., and said to be the average of the poor ores of the Valenciana Mine,
To spalling (<i>i.e.</i> reducing the large rocks of ore into small pieces fit for the stamping mills), at 1 <i>s.</i> per ton - - - -	0 10 0	
To stamping ten tons of ore fit for smelting, at 1 <i>s.</i> 6 <i>d.</i> per ton -	0 15 0	
To dressing ten tons of ore, including the calcination and carriage of the ore from one place to another, say average three mills, at 6 <i>s.</i> 6 <i>d.</i> per ton - - -	3 5 0	
To smelting five tons of dressed ores, the produce of ten tons of raw ores, at 4 <i>l.</i> 2 <i>s.</i> per ton *	20 10 0	
The duty on 800 oz. of silver being the produce of 10 tons of raw ores, of the average produce of 4 oz. per cwt. rated at 4 <i>s.</i> 6 <i>d.</i> per oz. amounting to 180 <i>l.</i> at 6½ <i>d.</i> per cent: - - - -	11 14 0	
	£51 14 0	£ 180
To balance as profit on 10 tons of raw ores - - - - -	128 6 0	
	£180 0 0	£180 0 0

“ The above profit of 128*l.* upon ten tons of raw ores amounts to about 12*l.* 16*s.* 7*d.* per ton.”

But the Valenciana Mine also contains ores of the richest quality, specimens of which, brought home by Mr. Dollar, were found, upon analysis by Mr. Moyle, to contain $6\frac{7}{8}$ per cent. of silver, and which

* Washed Silver ores might be smelted at one half this cost, where coals can be procured in abundance.

are worth 37*l.* 5*s.* per ton instead of 18*l.* per ton *. Vast quantities of these rich ores are contained in the pillars of this mine, which pillars are estimated by the best Mexican judges to be worth 40,000,000 of dollars, even if sold as formerly by auction at the pit's mouth; and it appears, that *two-thirds* of them may be removed with perfect safety to the mine, by substituting props instead.

The Directors from the above data will be enabled to appreciate the amount of returns to be expected, when the richer part of the Valenciana Mine, as also the richer ores of the other mines belonging to the Association are worked, the expenses of raising and converting the *richer* or *poorer* ores being the same.

It appears, however, that the Purissima and Rayas

* At about 5400*l.* per ton (12oz to the lb.) the following will be the value of a ton of raw ore at the different produces from 1-8 part in 100 up to 8 in 100.

$\frac{1}{8}$	-	£6	15	0	$3\frac{1}{8}$	-	£168	15	0	$6\frac{1}{8}$	-	£330	15	0
$\frac{1}{4}$	-	13	10	0	$3\frac{1}{4}$	-	175	10	0	$6\frac{1}{4}$	-	337	10	0
$\frac{1}{2}$	-	27	0	0	$3\frac{1}{2}$	-	189	0	0	$6\frac{1}{2}$	-	351	0	0
$\frac{3}{4}$	-	40	10	0	$3\frac{3}{4}$	-	202	10	0	$6\frac{3}{4}$	-	364	10	0
1 part in 100 parts	-	54	0	0	4	-	216	0	0	$6\frac{7}{8}$	-	371	5	0
$1\frac{1}{8}$	-	60	15	0	$4\frac{1}{8}$	-	222	15	0	7	-	378	0	0
$1\frac{1}{4}$	-	67	10	0	$4\frac{1}{4}$	-	229	10	0	$7\frac{1}{8}$	-	384	15	0
$1\frac{1}{2}$	-	81	0	0	$4\frac{1}{2}$	-	243	0	0	$7\frac{1}{4}$	-	391	10	0
$1\frac{3}{4}$	-	94	10	0	$4\frac{3}{4}$	-	256	10	0	$7\frac{1}{2}$	-	405	0	0
2	-	108	0	0	5	-	270	0	0	$7\frac{3}{4}$	-	418	10	0
$2\frac{1}{8}$	-	114	15	0	$5\frac{1}{8}$	-	276	15	0	8	-	432	0	0
$2\frac{1}{4}$	-	121	10	0	$5\frac{1}{4}$	-	283	10	0					
$2\frac{1}{2}$	-	135	0	0	$5\frac{1}{2}$	-	297	0	0					
$2\frac{3}{4}$	-	148	10	0	$5\frac{3}{4}$	-	310	10	0					
3	-	162	3	0	6	-	324	0	0					

Mines produced latterly much richer ores than the Valenciana, owing to the workings of the latter having gone beyond the richest part of the vein. Now as we have other mines upon the mother vein of Guanaxuato, one-fifth part of which only has been touched, (all the valuable mines, namely, Valenciana, Tapeyac, Cata, San Lorenzo, Sirena, Mellado, Fraustros, Rayas, and St. Anita, being included in a distance of 8529 feet,) there is every reason to believe, that in each of those mines similarly rich ores may be found, as in the Valenciana and Rayas Mines, but at different distances from the surface. Humboldt writes, “In this celebrated vein (the ‘Veta Madre’) there is a certain middle region, which may be considered as a depository of great riches; for above and below this region the ores have yielded an inconsiderable share of silver. At Valenciana, the rich ores have been in the greatest abundance, between 328 and 1115 feet below the surface, while the abundance appeared at Rayas at the surface of the earth.”

Again, the Baron says: “The mine of Rayas continues to furnish extremely rich ores, while at Valenciana they have endeavoured, for some years, to supply, by the extraction of a greater quantity, the deficiency in their intrinsic value.”

From the foregoing facts, and the quotations made from Humboldt’s writings, it appears, that we may reasonably expect to raise *treble* the quantity of ore formerly obtained from the Mines by working

them scientifically, and by the aid of machinery, which from the enormous extent of the mother vein, running in the Valenciana mine 500 feet deep, by 22 in width; *uninterruptedly*, and which it is probable it also does to a similar extent in the other mines lying on that vein, may obviously be accomplished; and as only a very small part of the mother vein has been yet opened, we may also confidently anticipate that our miners will discover new mines.

To have experimentally ascertained that the Mexican ores admit of being the *most beneficially* reduced, by the same processes that are employed for the reduction of the tin ores in Cornwall, is, I conceive, a fact of the utmost importance, and which opinion Mr. Moyle came to, after trying all the usual processes for reducing silver ores. Mr. Moyle also ascertained, that should it be found advisable to employ the process of amalgamation, (in consequence either of a scarcity of fuel, or from some species of the ores requiring to be amalgamated with quicksilver, in order to extract all the silver,) that this process, which cost the Mexicans from two to five months, and constant labour during that period, may be better effected in six hours; while Mr. Perkins has discovered a method of separating the two metals, with scarcely *any loss* of quicksilver, which loss has, hitherto, in Mexico, been very great and expensive.

Mr. Moyle having followed the Mexican process of amalgamation upon a specimen of Mexican ores,

ascertained, notwithstanding the small quantity operated upon, and the caution with which he conducted the amalgamating process, that pure silver, in the proportion of an ounce and a half to the ton of ore, was left unseparated. From the result of this experiment, it is probable, that considerably more than that quantity was left in each ton of the ore formerly worked by the Mexicans.

It is, indeed, obvious, that such must be the case, from the chemical principles upon which the amalgamating process depends, and the very imperfect manner in which the Mexicans endeavoured to carry those principles into effect. The process of amalgamation consists in taking advantage of the well-known chemical affinity existing between silver and quicksilver, which when brought within the sphere of each other's attraction, unite, and become what is termed amalgamated. In order then, that all the silver contained in a given quantity of ore should be thus taken up, it becomes necessary, not only that the ore be levigated to an impalpable powder, but also that the materials operated upon (consisting of the powdered ore, quicksilver, and other chemical agents employed) should be most intimately mixed, so as to form one uniform mass. The Mexicans did not execute either of these two operations, in such a manner as is absolutely necessary, to obtain the whole of the silver contained in their ores, for with their arastres or braying-mills, as they were called, they could not pulverize their

ores sufficiently fine : neither was it possible for them adequately to incorporate the enormous masses of materials they were in the habit of operating upon, at a time, in their courts of amalgamation, (extending from 80 to 90 feet in diameter, and in which the materials were from 19 to 23 inches deep,) their method being to whip round these courts twenty horses for many successive days, or weeks, and to employ men to tread them *barefoot*. Hence, it may be expected, that in the event of any considerable quantity of this amalgamated ore being found, it will prove sufficiently productive to pay well for washing, in order to obtain the remaining silver; and as no kind of machinery is required for this operation, it may be commenced immediately, on the arrival of the agents.

Baron Humboldt informed Mr. Williamson, (one of the Commissioners sent out to Mexico,) that the smelting of the ore was as imperfectly conducted as their amalgamation ; and he gave it as his opinion, that it would prove lucrative to smelt the ores over again.

At Guanaxuato and Catorce, there are vast quantities of *out-cast ores*, which were considered of too poor a quality to defray the heavy expenses incurred by the Mexican system of amalgamation, but which will adequately remunerate the Association, when reduced by the Cornish system : those of the Purissima Mine, from the following extract of a letter, with which Mr. Dollar has favoured me, appear to be particularly valuable.

Mr. Dollar writes:—“ At the Mine of Purissima, in Catorce, the quantity of out-cast ores is not only enormous, but the quality of the ores of that mine, in general, were excessively rich, and lie there in an undisturbed state. The great abundance of silver they got from this mine, made them careless, which induced them to throw away many ores of four marcs or upwards to the monton, (*i. e.* one ounce of silver to the cwt. of ore). In fact, the Obregons, the owners of the mine, told me on the spot, that they, in times of prosperity, did not know, themselves, what they threw away; but they are perfectly sensible of the value of these ores, even in their own way of calculating of having them worked up, and value them at a very high sum. This is where our business ought to be pushed without delay, as there is an immense quantity, and the proprietors are ready to deliver them over, giving the Company one-half.”

By reference to Mr. Moyle's estimate, it will be seen, that the net profit upon a ton of ore, containing *four ounces* of silver to the hundred weight, amounts to 12*l.* 16*s.* 7*d.*; consequently, if these Purissima ores average *one ounce* the cwt., the net profit upon each ton will be 4*l.* 14*s.*; included in which amount, however, is the saving of 1*l.* 10*s.* per ton for breaking and raising.

From the above facts it appears, that the smelting department sent to Mexico, will be enabled to commence profitable operations immediately on their arrival there, by washing the ores previously amalgamated, and by smelting the out-cast ores, both

which may be effected, although comparatively in a tedious manner, by repairing the apparatus they will find on the spot; and if this department be supplied with the requisite machinery from this country, as soon as it can be got ready and sent out, the share-holders may expect to receive returns long before the mines can be emptied of their water.

Should the Directors consider the foregoing information of sufficient importance to induce them to adopt the suggestions thrown out, the writer *feels confident*, that by the time one or two additional instalments have been called for, that returns will have been realized in Mexico more than sufficient to meet the current expences.

I have the honour to be,

Gentlemen,

Your obedient humble Servant,

WM. ADAMS.

SUPPLEMENT.

THE mining enterprises to the different sections of the New World, and the amount of British capital already embarked in them, have assumed an aspect of such great importance to the Public, that the writer, conceiving that the publication of any information of an authentic nature, will be considered to be both valuable and acceptable, is induced to publish the foregoing letter, which was addressed by him in the September of last year to the Directors of the Anglo-Mexican Mine Association.

The favourable views which he then entertained of the probable results to be anticipated from working the Mexican mines upon the Cornish system of mining, having been more than confirmed by the intelligence since received from the agents sent out to Mexico by the different Mining Associations, as well as from many other English persons either now in Mexico, or who have recently returned from thence, the writer proposes to add such parts of the information he has received, as bear upon the topics dwelt on in his letter, and also to go more into detail with regard to the Mexican system of mining, and reducing the ores.

By these data, any persons at all conversant with mining operations, will at once, perceive the extraordinary waste of human and animal labour with which these operations were conducted ; the excessive expenses to which the Mexican proprietors were consequently subjected ; and although probably very inadequately, will be enabled to appreciate the savings which must result from substituting steam and other machinery, in lieu of men and horses, to lift up the enormous quantities of ore and water daily raised, —as also from the adoption of the system of mining pursued in Cornwall, where the most beautiful and harmonious means are rigorously followed to save manual labour, and to employ it to the greatest advantage.

By way of elucidation, as well as to show the magnitude and value of some of the Mexican mines, the writer will give an outline of Baron Humboldt's description of the different mining and smelting operations pursued in the great mine of Valenciana, recently contracted for by the Anglo-Mexican Mine Association ; which is not only the most extensive and hitherto the most productive in the world, but is that whose operations the Baron selected for description, as being, when he examined it in 1803, the best wrought mine of any in that kingdom.

Particular circumstances have induced the writer to devote, during the last two years, a very large portion of his time to the consideration of subjects

connected with South America, but more especially to the modes hitherto pursued in working the mines, and converting the ores in those countries. He fortunately has had the means of collecting the most correct information upon every subject connected with the mines of Mexico, which great Republic, notwithstanding the hitherto limited developement of its natural resources in mineral wealth, it is known has produced, exclusive of its gold, more than four-sixths of the silver brought into use and circulation throughout the world.

Mexico, from its superior population, wealth, and fertility, to all the other colonies of Spain, was treated by the parent state with comparative respect and consideration. A vice-regal king represented the monarch of Spain—colleges for the education of youth (superintended, however, by priests) were established in the different cities and large towns of Mexico—splendid public buildings were erected at the public expense, and very liberal institutions, as regards the mining establishments of the country, and their improvement, were maintained by the Spaniards. Indeed, from the immense revenues which were drawn by them from the mines, amounting in all to 33 per cent. upon the gross produce, it can be no matter of surprise that such should have been the case.

In consequence, however, of the characteristic jealousy of the Spaniards, Mexico, in common with the other sections of the late Spanish colonies, was

shut against every foreigner as much as China ever has been. In fact, it was certain death to all foreigners found within the late Spanish territories, unless with the especial permission of the court of Spain. This circumstance will account for the extraordinary ignorance with which the mining, and smelting, or amalgamating operations were conducted, notwithstanding the desire of the court of Spain to introduce a better system of things; the Spaniards being notoriously amongst the most backward and illiterate in the arts and sciences of any of the nations of Europe. If, then, under these most unfavourable circumstances, the mines of Mexico were made to produce such vast quantities of the precious metals, as the official records of the royal mints make appear, what may not be expected from the employment of our machinery, and the substitution of our improved system of mining, in the working of these vast depositories of mineral wealth!

The eminent natural philosopher and traveller, Baron Humboldt, visited most of the late Spanish colonies, in the years succeeding 1800 and 1801. He carried with him orders from the court of Spain to the viceroys of Mexico and Peru, as also to the other superior authorities of such provinces as he might visit, to afford him free access to their archives of every description which could aid him in his scientific researches. Such powers, brought by such a man as the Baron, could not fail to obtain for him the most respectful consideration from all

classes in South America. The authorities, and the most wealthy and intelligent mine-owners, vied with each other which should render themselves most useful to the distinguished traveller. This seems to have been the case in a more especial degree in Mexico, where the Baron resided more than a year.

Baron Humboldt says, " Having been engaged from my earliest youth in the study of mining, and having myself had the direction for several years of subterraneous operations, in a part of Germany which contains a great variety of minerals, I was doubly interested in examining with care the state of the mines, and their management in New Spain." Hence, before visiting the mines, he began with the mint, examined its various arrangements, its archives, duties, and produce, during the last three centuries. Within this period (namely, between 1492 and 1803) Mexico had paid duty upon the enormous amount of one thousand and thirty millions, five hundred and forty-two thousand, six hundred and ninety pounds sterling (1039,542,690*l.*), but which amount, it is estimated, did not much exceed one-half, or, at the utmost, two-thirds of the *actual produce*, in consequence of the excessive corruption " amongst the host of European Spaniards sent out almost annually to the colonies," and who alone were permitted to hold offices of public trust* ;

* Mr. Robinson, an American merchant of great respectability, who has published the history of the Mexican Revolution, writes,

and also of the smuggling which naturally resulted from the inordinate duties already noticed, amounting to 33 per cent. upon the gross produce. It appears that within the one hundred and thirteen years preceding Humboldt's visit (between 1690 and 1803), 284,224,924*l.* sterling had been produced; and by referring to the official tables of the mint,

“ After the death of Charles the Fifth, his successors appear to have studied which of them could most outrageously trample on the laws enacted during that monarch's reign. The Americans have not only been excluded from the privileges granted them by those laws, but even the descendants of the conquerors have been despoiled of many of their rights. Men without education, talent, or character, have been appointed to civil, military, and ecclesiastical offices of the greatest responsibility; and corruption in the latter period had reached so great a height, that most offices in America were either sold at a fixed price, or procured by court parasites.

“ During the famous, or rather infamous, administration of Godoy, sacrilegiously called the Prince of Peace, every office in America, from that of the viceroy down to that of a menial dependant of the custom-house, was publicly sold, except in a few instances, in which they were bestowed on the servants of the Prince, as a premium for their intrigues, or, as it was styled, to reward their fidelity to their royal master or royal mistress. A major-domo of the royal household has been elevated to the government of an American province; and there have been intendants, and judges of the Real Audiencia, the highest judicial tribunal in America, who were well known in Spain for their vices only, or as panders to the passions of the Prince and the Queen. Under men like these were the lives and the properties of the Spanish Americans placed.”

recently received from Mexico by the writer*, it will be seen how large a proportion of the latter sum was raised during the half century prior to the Mexican revolution, which commenced in 1810. In fact, from 1770 to 1809, (the year before the Revolution,) the produce of the mines appears to have been nearly double the amount raised during any other corresponding period, since the original conquest of Mexico, three centuries ago †.

The writer is anxious to impress this fact upon the minds of his readers, in order to guard against the opinion, that the cessation of the working of the Mexican mines originated in the diminution of their mineral wealth. It was the political events terminating in revolution which gave the death blow to mining industry, as is seen by the interesting and affecting report to the viceroy of Mexico, of the Assay Master-general of the province of Guanaxuato, the chief seat of the mining operations of the Anglo-Mexican and of the United Mexican Mine Companies, referred to in the preceding letter. ‡

* See Appendix, Doc. 2.

† It will be seen by the subjoined statement, taken from the tables in the Appendix, that the increase of the produce of the precious metals has been progressive up to the period of the revolution.

The produce from 1690 to 1729 (40 years)	245,884,696	dollars.
1730 to 1769	—	422,995,914
1770 to 1810	—	795,884,696

‡ See Appendix, Doc. 1.

The revolution commenced October, 1810—Hidalgo, a native priest, struck the first blow. Combinations among the oppressed natives had been extensively formed, for the purpose of effecting the long-wished for revolution. But the intentions of the chief actors having been divulged to the Spanish viceroy and his government, Hidalgo had no alternative but to collect his followers, and to take the field, without the promised co-operation of the other intended supporters of the independent cause. He summoned and carried with him the whole male population of his cure capable of bearing arms, consisting of about 17,000 men; which number, on his march to Guanaxuato, increased to above 20,000. With this rabble, armed with such weapons as they could procure, he carried by storm the town and garrison of Guanaxuato, which action, and its consequences, are described by Mr. Robinson, in the following words:—

“ A large portion of the Creole population, who were as desirous as Hidalgo and his party for the emancipation of their country, now began to tremble for their personal safety, and sought protection from their ancient oppressors. Nevertheless, the forces of Hidalgo continued rapidly to swell; and, during his stay at Zelaya, the Indians, from every quarter, flocked to his standard. Numbers of Creole priests, and some royalist soldiers, also joined him. When he left Zelaya, his army consisted of nearly 20,000 men;—but it was a heterogeneous mass,

without fire arms or order. With this force he marched upon Guanaxuato, the capital of the intendancy of that name, and a city next in point of wealth to the metropolis of New Spain ; the richest gold and silver mines in all Spanish America being in the vicinage of Guanaxuato. On the approach of the patriotic army, the intendant of the province, with all the Spaniards, some Creoles, and the few troops that were in the city, shut themselves up in the castle, and determined on an obstinate defence. Hidalgo summoned them to surrender, and offered them humane terms, which were rashly refused. The place was attacked and carried. The unfortunate Spaniards, and all who adhered to them, were sacrificed by the infuriated Indians. In vain Hidalgo interposed to prevent the slaughter. He now saw, when too late, that revenge was the predominant feeling among his Indians, and that nothing would satisfy them but the extermination of the Gachupins*.”

The treasures which fell into the hands of the

* “ This term *Gachupin* has been variously interpreted ; but it is universally used by the Creoles and Indians as a word of contempt. The Spaniards say, it means “ a man with two heads,” thereby conveying an idea of superior understanding ; and that it took its origin from the invasion of Cortez, upon one of his cavalry being killed. The Indians, who, till then, had never seen a horse, supposed the animal and its rider to be a single animal. When they beheld the horse and rider fall, they ran up and examined

conquerors would appear incredible to the reader, if he did not consider that we have reference to a city surrounded by the richest mines in the known world. The sacking of the city continued for three days; and the plunderers were loaded with doubloons, dollars, and ingots of gold and silver. The precious metals were found in some private houses, as well as in the public buildings, piled in vast heaps. The Indians were occupied several days in carrying off these treasures; and it was supposed that each man took away at least five hundred dollars, and the greater proportion several thousands. The Indians afterwards offered their doubloons for sale at four reals each, conceiving that they were only gilt medals.”

This immense sum of money found in Guanaxuato by Hidalgo's army, shews that, up to that period, the mines were highly productive; but the important fact is placed beyond all doubt by the tables of the returns of the royal mint of Mexico, recently received by the writer*, communicating the amount of silver and gold coined between the years 1690 and July 31, 1823, by which it appears that in 1809 the

the phenomenon, and finding the man distinct from the horse, they expressed their surprise by exclaiming “Gachupin.” The Indians, however, flatly deny the Spanish story, and say the word means “thief.” But be that as it may, it is most certain that the word is now used by both as a term of scorn and opprobrium.”

* Vide Appendix, Doc. 2.

amount was 26,172,982,26 dollars, which annual produce has never been equalled, except in the years 1804 and 1805, when the amount of the former year was 27,090,001,03, and that of the latter 27,165,888,33. The inevitable conclusion, then, must be, that as the stoppage of the working of the mines originated in the great diminution of mining industry consequent on a twelve years' revolution, that whenever they are again brought into activity by the aid of British industry, science, machinery, and capital, not only will they be made to equal their former produce, but infinitely to surpass it.

It may be almost difficult for a person not well informed on the subject, to comprehend the vast produce of some of the Mexican mines, as there are no parallel examples of the kind in the world. One of these, namely, the Valenciana, Baron Humboldt has very minutely described in his work on New Spain. The Baron states this mine to be the richest mine of Mexico. It lies from eighty to an hundred leagues further in the interior than the city of Mexico, on the mother vein of Guanaxuato. This mine, the Baron affirms, produced as much silver in the year 1791 as was produced by the whole kingdom of Peru that year, and that it yields seven times more metal than the mines of Freiberg, and one-half as much as the whole kingdom of Saxony!! He moreover adds, that the amount of the sales of the raw ores at the pit's mouth (where, as in Cornwall, they are sold weekly by auction), ave-

raged, during thirty-three years, from 1771 to 1804, the enormous sum of 583,380*l.* per annum, while he also asserts that it “never yielded less net profit” during forty years, than from 82,506*l.* to 123,759*l.* per annum, notwithstanding the excessive expenses incurred, and the unscientific manner in which every operation as connected with the mining department was conducted. Some years the net profits amounted to 250,000*l.* This mine continued exceedingly rich up to the period of the revolution in 1810, as is proved by official documents brought to this country, which state, that up to that period it continued to produce ores to the amount of a million and a half dollars per annum.

The accounts which have reached this country from the mining districts, through different channels, as well as the letters recently received from Mexico, fully confirm the favourable opinions advanced by the writer, and it is publicly mentioned in the city that they are now raising two thousand mule loads of ore per week, from the upper works of the Valenciana mine, which quantity of ore, calculated at the value of four ounces of silver per cwt. of ore, (Humboldt’s estimate) would give a produce exceeding 5000*l.* weekly. Such being already the case, it is difficult to form any accurate estimate of what will be the value of the produce of this mine (declared in a published letter of Captain Garby, the chief miner sent out by the Anglo-Mexican Mine Company, to be more valuable than all the

mines of Cornwall united), when it is freed from its water, and in full work; and when the very rich ores contained in its colossal pillars, or supports, between the different workings can be reached. These pillars are estimated by the best Mexican judges to be worth 40,000,000 of dollars, or 8,000,000*l.* sterling, even if sold at the pit's mouth, but, from the information received, it is probable that these enormous masses of rich ore which constitute the pillars between the six or eight-and-twenty horizontal tiers of workings in this mine, will produce eight or ten times that amount, when converted by the improved systems of smelting, or amalgamation.

Hence then, whenever the mine becomes exhausted of its ores, an immense property may be realized, by the entire removal of these pillars; while according to the opinions of Mr. Moyle and Mr. Garby, two-thirds of them may, even now, be removed without danger to the mine, by substituting props of wood, combined with refuse stones, as is the practice in Cornwall under similar circumstances.

It appears that the Valenciana mine, (although now more than half full of water) was a dry mine, and in no wise inconvenienced by water, until inundated by the neighbouring mine of Tepeyac, from the accidental junction of their works.

Its greatest depth is seven hundred yards from the surface. The extent of the vein of ore has in

some parts been greater than has ever been equalled in any other mine, amounting according to Humboldt to 557 feet deep, by 22 in breadth uninterruptedly. It is chiefly composed of the sulphuret of silver, embodied in clay-slate. A great deal of native and red silver have been also found in the rich part of the mine, included between the distance of 328, and 1115 feet from the surface, which circumstance mainly contributes to render the pillars so extremely valuable.

The number of persons and animals formerly employed in working this mine, is prodigious, amounting to three thousand and one hundred persons, and fifteen thousand horses and mules. Eighteen hundred of the former worked in the interior of the mine, twelve hundred of whom bored and blasted nearly six hundred holes, of 4 feet 11 inches deep, every twenty-four hours. Calculating the blasting of each hole to separate, on an average, from a half to three-quarters of a ton of ore, the general produce would be between three and four hundred tons daily. A large proportion of the remaining persons were employed as Tenitores, (Porters) in carrying up the ores on their backs, to the "Place of Assemblage," near the mouth of the mine, from whence they were lifted up in bags made of bullocks, hides, by Mallacatoes or Whims, which were moved round by horses or mules.

The Tenitores or "beasts of burden," as Humboldt calls them, whose number amounted to about

a thousand, the year in which he visited this and the other mines of Gunaxuato, cost the proprietor 31,448*l.* per annum, while the consumption of gun-powder averaged 16,668*l.* annually; even the steel and iron consumed in this mine exceeded 6000*l.* per annum. The expense also of the bags could not have been trifling, as they cost from seven to ten francs each, and lasted but a very few days. Indeed the Baron affirms, that the Count de Regla's mine (The Real del Monte) expended 31,252*l.* per annum in these skin bags; while from the much greater magnitude and depth of the Valenciana mine than that of the Real del Monte, it is probable that the expenses of the former must have been still greater.

In the arrangement of the different workings of the mine or galleries, as Humboldt calls them, there was an equal want of judgment, or indeed of common sense, as in all their other operations; for all these, some of which extended great distances underground from the main shaft, were separate, and had no connexion with each other, so that each gallery might be considered to be a separate mine, consequently increasing the manual labour to an enormous extent. Humboldt affirms, that two-thirds of the expenses of the Tenitores might have been saved, by effecting communications between the different tiers of workings, so as to employ wheelbarrows drawn by dogs, to convey the ores to the main shaft, instead of their being carried thither on men's shoulders.

The Baron severely censures the master-miners, with being wholly indifferent to the reforming of abuses, and the perfecting the art of mining, while he represents the miners as very dishonest. In proof of this, the managers of the Valenciana mine had found it necessary to examine the persons of the workmen daily, on their quitting the mine, upon whom, between 1774 and 1787, was found silver to the value of 63,000*l*.

The enormous number of horses and mules employed in working this mine, arose from its great depth, and the vast quantities of ores and water, which they had daily to draw up. Sixty-four horses, which were changed every four hours, were employed night and day, in drawing up water in skin bags, by Mallacatoes, eight horses to each, and each Whim could only take up 1250 pints of water at a time; whereas from the necessary leakage of the bags, consequent on their striking against the sides of the shafts, &c., they frequently could not discharge any thing near that quantity; and when we consider the great depth of this mine, approaching nearly to half a mile, 700 yards, (a mile being 1760,) the accumulation of water must have even more than equalled the quantity thus drawn up. It therefore became necessary to keep these Whims constantly at work, and it was found that, if they ceased but for an hour, the water gained upon them. In the smaller mines it was the practice to bring up the water, as well as the ores, upon men's shoulders. Hence is explained,

the cause of almost the whole of the Mexican mines becoming inundated during the revolutionary war, when the mining districts, alternately visited by the contending parties, were robbed and maltreated by both, until the mine owners were utterly ruined, as detailed in the Report of the assay-master-general in the Appendix.

The consumption of time and expense in extracting the silver and gold from the ores (for all the Guanaxuato mines more especially the Valenciana and Rayas mines, have gold incorporated in small proportions with the silver; as has also the Purissima Conception Mine, one of those contracted for by the Anglo-Mexican Mine Company, on the great mother vein of Catorce,) was, if possible, more extravagant than the obtaining them from the mines. Without regarding the many chemical combinations in which the silver is found, they indiscriminately pursued either smelting, or amalgamation with quicksilver, and this too without taking into account the abundance or scarcity of fuel, or the greater or lesser price of quicksilver, which during the late war between Spain and this country became at times exceedingly scarce and dear. They nevertheless gave a decided preference to the amalgamating system, as is proved by the archives of the mint, which state the relative quantity of silver produced by amalgamation and smelting, which Humboldt states to be as three and a half of

the former to one of the latter. This amalgamating process is thus described by the Baron:—

The ores having been purchased at the mines' mouth by the amalgamator, were carried by mules to the "Haciendas de Plata," by which name their smelting or amalgamating works were designated. They began by breaking the large fragments of ore into small pieces with a rude sort of stamping-mill, worked by hydraulic wheels on mules or horses. By a second operation they were then reduced into smaller bits fit for the "Arastras" or braying-mills, which consisted of two very hard circular stones of porphyry, weighing from seven to eight hundred pounds each, and which were kept in rotatory motion by hydraulic wheels or mules*. The ore was thus ground to a powder in a similar manner as corn is reduced to flour in this country. But the process must naturally have been exceedingly slow and tedious, when we bear in mind the immense quantities of ore produced from the Guanaxuato mines. Humboldt states that one of those mills would "bray" from 662lbs. to 882lbs. in twenty-four hours. The ores thus powdered were then conveyed to the "Courts of Amalgamation," which were from 65 to 98 feet in diameter, and paved with flag-stones; and after

* In this respect Captain Garby's report differs from Humboldt, but probably those wheels were destroyed during the Revolution.

having been moistened, were mixed in vast heaps with certain chemical ingredients, consisting of mercury, muriate of soda (sea-salt), sulphates of iron and copper, kali (sub-carbonate of pot-ash), quicklime, &c. These ingredients in certain proportions were mixed and incorporated with the moistened powdered ore (called Schlich), by means of twenty or thirty horses or mules, whipped round the Court of Amalgamation for days and weeks together, and by men treading it during a still longer period barefoot, whereby the mercury became absorbed into the constitution, and these wretched people were soon salivated, became paralytic, and ultimately died the most painful deaths. On this account it was, as well as from the greater economy of substituting horses or mules for men in this process, that the practice originally imported from Peru was received as being most important.

It has been stated by the writer in his letter to the Directors, how inadequate were the means employed, to effect the chemical combinations intended, and consequently the great quantity of silver which was left unincorporated and thrown away*. They allowed six times as much mercury,

* It is the established practice in Cornwall to lessen the bulk of the tin ore to be smelted as much as possible, by reducing it to very fine powder, and then washing it on an inclined plane, over which a gentle stream of water passes, which carries off the lighter or earthy parts of the ore, while the metallic parts sink and are found deposited in the upper part of the plane. By re-

as the quantity of silver supposed to be contained in the mass of ore about to be operated on; and after treading, mixing, adding, and operating upon these enormous quantities, during a period extending *from two to five months*, the amalgamating process was then considered to have been completed, *i. e.*, that all the silver and gold capable of being taken up by the mercury had united with it, and formed an amalgam. They then separated the earthy particles of the ore from this amalgam by a stream of water, which however carried away with it considerable quantities of the quicksilver, which was afterwards collected in the neighbouring streams, by poor women employed for that purpose. To separate the two metals, the usual process of distillation was practiced, in accomplishing which, nearly twice the weight of the silver produced was lost, namely from eleven to fourteen ounces to the eight ounces of silver. Now as quicksilver was frequently a dollar, and a dollar and a half

peating this process and calcining it, if in combination with other metallic substances, the bulk is still further reduced, frequently from one-tenth to one-twentieth of its original quantity. As the same process it has been ascertained is equally applicable to the silver ores as to the Cornish tin ores, the reader will perceive of what immense importance this preparatory process will be in the amalgamation of the silver ores; as it is necessary that the particles of silver and mercury should approximate within the sphere of each other's chemical attraction, in order to effect their combination, without which union no silver can be separated by the amalgamating process.

per pound, it follows that the loss in mercury alone amounted to an eighth, or a sixth, of the produce, exclusive of the enormous expenses incurred in manual and animal labour, chemical materials, &c. Humboldt says, "At Freiberg the silver is extracted in the space of twenty hours; they employ from sixty to one hundred and fifty times less time than in the Spanish colonies, and consume eight times less mercury."

This statement of the Mexican systems of mining and smelting, by the Baron, is by no means overcharged; so far, indeed, is this from being the case, that Mr. Garby, whose name has been already mentioned, who was considered, in Cornwall, to be one of the very best practical miners in that county, and with whom the writer is personally acquainted, has recently transmitted in a letter to Mr. Moyle, a luminous, and most interesting statement respecting the Valenciana Mine, and of the general modes of conducting the mining and smelting operations in Mexico, which even goes further than that of the Baron. Mr. Garby's communications are dated September, 1824: He says,—“Since writing the above, I have been under ground, inspecting Valenciana; having inspected the mine, very minutely, above the water, 200 yards deep, but I can scarcely attempt to give you an idea of its magnitude; it is 1500 yards long in its longest extent, now working above water, about half of that length. Its greatest depth, now in water, is 498 yards, and

200 yards above. The Lode is from two to fifteen yards wide, and of this the greater part has been worked; but in this immense mine there is not a single level that you can put a barrow through, and but four shafts in all its length. I calculate that an adit may be brought into that mine from 80 to 100 fathoms deep, by driving 400 fathoms. Yet notwithstanding the great inconvenience they have been put to, by the best part of the mine being full of water, they have never thought of this auxiliary relief."

Captain Garby, in another part of his letter, states the results of his inspection of numerous other mines in the district of Guanaxuato, and says: "I believe there are very few of these mines but may be made profitable by the introduction of our improved Cornish system of mining. There are many of the mines from 1 to 300 yards deep, that have no shaft or machinery, for discharging either water or stuff*, but all accomplished by manual labour, on men's shoulders. They have no method of extending levels, or driving adits, but to cut an opening on an inclined plane into the mine, without any consideration of its ultimate utility. They work wherever they find metal, without any regard to any other circumstance, which is a full description for you of that plan and section of Valenciana, which you and I were desired to inspect whilst in Lon-

* A provincial term, meaning ores, earth, or rubbish of any kind.

don ; and all the mines that I have inspected seem to be worked on the same irregular and confused system.

“ In some mines, there are opportunities to get adits of near 100 fathoms deep, by driving 300 fathoms, yet they have not availed themselves of this advantage, in a single instance that has come under my observation. But we shall certainly avail ourselves of adits whenever they offer such advantage. In several instances, there is water to drive power-wheels a great part of the year, but it has never been used in any way whatever, and, I believe, a water-wheel is not known in the country, *I have not heard* of such a thing. The water is taken out of the deep mines by malacates, (whims, English,) and out of the smaller mines, on men’s shoulders. And all the processes of crushing and dressing the ore are performed by mules. Very fortunately, the water in the mines is very little.

“ I cannot pretend to give a relative comparison between wood and coals, not having seen any experiments thereon. All fires, for domestic purposes, are of charcoal, supplied by the Indian peasantry from the country. They bring it from many miles, and sell it here for from three to four rials, *1s. 6d. to 2s. the cargo, a donkey load of about 1½ cwt.* I have no means, as yet, of judging of the quantity of water to be taken out of the deep mines.

House-water must be drawn generally, wherever a steam-engine is applied*.

“ The mode of crushing and amalgamating I consider is very rude, expensive, and tedious. The stone for the stamps is reduced in the mines to the same size of our tin-stone, when offered for sale in the mine. It then undergoes the operation of stamping dry. Their stamping-mills carry eight heads, of from 75 to 100 lbs. each: this is worked by four mules at a time 16 or 24 hours, by which they crush about five ton to the size of our buck work, the three-hole to the inch sieve. This five tons supply twenty arrastres or grinding machines to pulverize the ore to the size of passing through our finest stamp grates. These grinding machines are very rudely constructed. There is a circular trough of either wood or stone, of nine to ten feet diameter, made water-tight, in which is fixed a pivot stock for the millier or axle, taking four cross arms, to which is connected four large rude-looking stones, a stone to each arm of from three to five cwt. each. They then put about fifteen inches of water, and charge it with about five cwt. of the crushed ore, and set the arrastres to work by two mules at a time, changing every six hours. This process requires 24 hours to grind the charges to

* House-water means water pumped up from the bottom of the mine, for the purpose of condensing the water employed in the low-pressure steam-engine.

an imperfect slime. You will perceive that the process to pulverize is tedious and expensive, requiring upwards of 100 mules and 30 men to pulverize five tons of stone. After the grinding process, it is thrown out in a pond or slime pit for ten or fifteen days successively, from the arrastres on the amalgam plot, in a state of thin slime, and then lays until drained to a consistency of thick paste, and then they apply their portions of quicksilver, and salt, &c. It is then trodden by mules for twelve or fourteen days (six mules at a time,) requiring for the whole process, the employment of 120 mules continually, for pulverizing, &c., five tons a day. Nearly the whole of this work might be done by a twelve or thirteen-foot wheel-stamp, which would make a considerable salvage*.”

* Captain Garby, when speaking of the local condition of the country, says, “ We have no reason to complain of the treatment we receive from the natives : the better sort are extremely civil, and even polite.

“ The country is beautiful, and if inhabited by an industrious and intelligent people, would be the paradise of the world. Luxuries are not known, being never sought after. Necessaries of life are abundant and cheap. A side of a sheep, from fifteen to twenty pounds, from 5 to 8 reals (a real is the eighth of a Spanish dollar); beef of good quality, but badly dressed by the butcher, for 2*d.* per pound. Pork, of a superior quality, about 4*d.* per pound. Poultry plenty, and not dear; superior class of fowls for 2*s.* 6*d.* the pair; a good turkey for 3*s.* Bread equally cheap, but not good; it is fermented by leaven, and generally very sour. Roots and vegetables scarce and dear; but I am fully persuaded if properly cultivated, would soon become plenty and cheap.

Captain Garby concludes his letter by saying, "Mechanics in every branch is far more behind than I could possibly have conceived, if I had not been here to witness it. The handicraft tools of every description are entirely useless to an English mechanic."

Such being the statement written upon the spot, by so competent a judge as Captain Garby, with regard to the operations connected with the mines of Mexico, the writer cannot but feel satisfaction at having been the first Englishman, as far as he knows, to make and put upon record any calculations of a comparative nature, between the Mexican and English modes of mining and reducing the ores, and to point out the very great advantages to be derived from the adoption of the latter; and this too at a period when a great deal of despondency and unfavourable opinion universally prevailed, with regard to the results of the mining undertakings about to commence in Mexico. It was after the most careful scrutiny which he had instituted, as to the relative merits of the two systems, and a knowledge of the immense profits formerly obtained by the Mexicans, notwithstanding their excessive waste of money and

Fruits in abundance, but not in high perfection for want of proper cultivation. It appears that there is no trouble taken with the trees and plants; they let every thing grow spontaneously. Grapes are sold for 3*d.* per pound. Pine-apples large and fine for 3*d.* each. Pomegranates, peaches, apples, pears, &c., equally reasonable. I like the country much, and am flattered with our prospects before us."

labour, which induced him to embark so largely in the two public Mexican companies, the Anglo-Mexican Mine Association and the United Mexican Mine Company, and to retain, as he has done, through their various fluctuations, all his shares in both.

Although the foregoing favourable prospects apply much more forcibly to the above-mentioned Companies, and to that of the Real del Monte, from their having been the first to form contracts in Mexico, and their having secured the most celebrated mines situated on the richest veins in that country, namely, the Guanaxuato and the Biscaina veins; still the general reasoning applies in a greater or less degree, to most of the numerous mining companies which have emanated from these, the parent associations.

It were perhaps to be wished, that a less degree of the spirit of speculation had entered into some of these enterprises; because it is to be apprehended, that where companies have been formed without the necessary knowledge of the local circumstances of the mines intended to be worked, and of their real and intrinsic value, loss and disappointment may in such cases result, which circumstance would not fail to throw a gloom generally upon the proceedings of all mining enterprises, and thereby affect for a time the credit even of those, which have been bottomed upon the most secure and solid foundation.

In addition to Captain Garby's statement, the writer has recently received from Mexico, the opinion of one of the most intelligent and experienced practical miners in that kingdom, further corroborative of his opinion with regard to the ultimate results of the mining operations about to commence. While the favourable opinion lately expressed by Baron Humboldt to an English gentleman in Paris, with reference to the prospects of the Anglo Mexican Mines Association, and its having secured so many of the principal mines in Mexico, must be highly interesting—namely, “*that it could not fail to prove the most important and lucrative undertaking that had ever yet been entered into.*”

The only occurrences required to ensure that success, which, from the facts detailed there, are the best grounds for expecting, have recently taken place. Many persons entertained the opinion, that however successful the mining operations in Mexico might prove, that much danger was still to be apprehended both from without and within. The Colonies were threatened with reconquest by the Parent State, aided by other European Powers, while all internally was represented to be in a state of anarchy and confusion ; but recent political events have removed both these causes for alarm. By our recognition of Mexico and Columbia *, and the commercial treaties formed be-

* The writer has hitherto confined his observations to Mexico,

tween Great Britain and these New Republics, as also by the death of the Ex-emperor Iturbide, their independence is now irrevocably fixed; and the permanent tranquillity of the people secured; for it would be contrary to all experience that, where nations have suffered so enormously in blood and treasure as the Mexicans and Columbians have done, during the last twelve years' revolutionary war; after they have fought out their independence; have been admitted into the great family of nations; and moreover have established a popular and representative Government, that they would plunge into civil dissensions, more especially after the only individual at all likely to occasion such dissension had perished in making the attempt.

The commercial treaties lately entered into with the States in question, must certainly add very great security to all enterprises of a mercantile nature, undertaken by British subjects in those states; as British property will thereby be protected by the English Government, equally as in any other part of the world, where our interests are repre-

as this publication refers solely to the Mexican Mines. But it would be injustice to Columbia, that great and warlike republic, were he to pass over in silence the good faith, and praiseworthy principle, observed by that government to her creditors—the energies she has displayed, under the most trying circumstances—the capabilities she possesses, not only as to agricultural produce, mines, &c., but also, as to mercantile pursuits, from her many excellent harbours, and above all, the desire which she has always manifested to cultivate the most intimate commercial relations with this country.

sented by a British Minister; but this final step on the part of our Government, was not, in point of fact, necessary, to ensure that security for British property embarked in Mexico, the want of which alone could disappoint the just expectations of those who first entered into the mining enterprises to that country. The generous and magnanimous character of the Creole population of Mexico, evinced, in their conduct to their deadliest enemies the Spaniards, (as described by Robinson,) and the just and honourable character of their Government, shewn in their voluntary pecuniary acknowledgments *, and in their noble acts to the

* By an official statement of the internal national debt of Mexico, a copy of which the writer has recently received from that country, it appears that fully one half of that debt has been incurred by the present Government taking upon themselves the responsibility of repaying to the Mexican people the amount deposited by them prior to the Revolution in the Consulado (a sort of national bank), the whole of the funds of which the Vice Regal Government had either appropriated to its uses, or carried off when expelled from Mexico. Another portion of their internal debt consists in the Government also engaging to repay nine hundred thousand dollars belonging to individuals, which the late Emperor Iturbide had undertaken to escort from Mexico to Vera Cruz; but which money his soldiers, by his command, seized upon the road, and it was appropriated to his own use and to that of the courtiers around him, as also to the payment of his troops.

A third part of this debt arises from the pecuniary responsibilities incurred by the different Patriot Chiefs since the breaking out of the Revolution, 16th Sept. 1810, on account of the inde-

late Emperor Iturbide and his family, would have been a sufficient guarantee that there was nothing to fear. If then such was the case before the recognition of Mexico by this country, what additional security is afforded to Englishmen by the present feeling towards Great Britain; when by that recognition, Mexico is relieved from all apprehensions of invasion, and the existing Government has thereby, at once, acquired that degree of firmness and solidity, which for many years it could not otherwise have even hoped to attain.

Moreover, the Mexican Government is fully aware, and indeed point to the fact, in several of their public declarations, that in the present exhausted state of Mexico, arising from the long-continued suspension of industry, and from the excessive drain of property to Europe by the Spaniards, during, and at the termination of the late contest, they must be indebted to foreigners for the capital, and the means to restore the prosperity of their once flourishing country. Now it is obvious, that unless good faith and protection of property be observed towards such foreigners, Mexico cannot obtain the aid which is absolutely essential to her own resuscitation. Consequently, as a dry question of policy, setting aside every other consideration, the Mexican

pendent cause, the amount of which obligations having been ascertained by a Board of Liquidation appointed for that purpose, has been recognised by the present Government.