

me, delinquent as I was; but not the less had she expressed her opinion, in language terribly strong, of the awkwardness of which I had been guilty, and had shown almost an aversion to my English character. I should leave Seville as quickly as I could, and should certainly not again put myself in the way of the Marquis D'Almavivas. Indeed, I dreaded the moment that I should be first alone with her, and should find myself forced to say something indicative of my feelings—to hear something also indicative of her feelings. I had come out this morning resolved to demand my rights and to exercise them—and now my only wish was to run away. I hated the marquis, and longed to be alone, that I might cast his button from me. To think that a man should be so ruined by such a trifle!

We descended that prodigious flight without a word upon the subject, and almost without a word at all. She had carried herself well in the presence of Almavivas, and had been too proud to seem ashamed of her companion; but now, as I could well see, her feeling of disgust and contempt had returned. When I begged her not to hurry herself, she would hardly answer me; and when she did speak, her voice was constrained and unlike herself. And yet, how beautiful she was! Well, my dream of Spanish love must be over. But I was sure of this: that having known her, and given her my heart, I could never afterwards share it with another.

We came out at last on to the dark, gloomy aisle of the Cathedral, and walked together without a word up along the side of the choir, till we came to the transept. There was not a soul near us, and not a sound was to be heard but the distant, low pattering of a mass, then in course of celebration at some far-off chapel in the Cathedral. When we got to the transept, Maria turned a little, as though she was going to the transept door, and then stopped herself. She stood still; and when I stood also, she made two steps towards me, and put her hand on my arm. "Oh, John!" she said.

"Well," said I, "after all, it does not much signify. You can make a joke of it when my back is turned."

"Dearest John!"—she had never spoken to me in that way before—"you must not be angry with me. It is better that we should explain to each other, is it not?"

"Oh, much better. I am very glad you heard of it at once. I do not look at it quite in the same light that you do; but nevertheless—"

"What do you mean? But I know you are angry with me. And yet you cannot think that I intended those words for you. Of course I know now that there was nothing rude in what passed."

"Oh, but there was."

"No, I am sure there was not. You could not be rude, though you are so free-hearted. I see it all now, and so does the marquis. You will like him so much when you come to know him. Tell me that you won't be cross with me for what I have said. Sometimes I think that I have displeased you, and yet my whole wish has been to welcome you to Seville, and to make you comfortable as an old friend. Promise me that you will not be cross with me."

Cross with her! I certainly had no intention of being cross; but I had begun to think that she would not care what my humour might be. "Maria," I said, taking hold of her hand.

"No, John, do not do that. It is in the church, you know."

"Maria, will you answer me a question?"

"Yes," she said, very slowly, looking down upon the stone slabs beneath our feet.

"Do you love me?"

"Love you!"

"Yes, do you love me? You were to give me an answer here, in Seville, and now I ask for it. I have almost taught myself to think that it is needless to ask; and now this horrid mischance—"

"What do you mean?" said she, speaking very quickly.

"Why, this miserable blunder about the marquis's button! After that, I suppose—"

"The marquis! Oh, John, is that to make a difference between you and me?—a little joke like that?"

"But does it not?"

"Make a change between us!—such a thing as that! Oh, John, John!"

"But tell me, Maria, what am I to hope? If you will say that you can love me, I shall care nothing for the marquis. In that case, I can bear to be laughed at."

"Who will dare to laugh at you? Not the marquis, whom I am sure you will like."

"Your friend in the Plaza, who told you of all this."

"What, poor Tomás?"

"I do not know about his being poor—I mean the gentleman who was with you last night."

"Yes, Tomás. You do not know who he is?"

"Not in the least."

"How droll. He is your own clerk—partly your own, now that you are one of the firm. And, John, I mean to make you do something for him; he is such a good fellow; and last year he married a young girl whom I love—oh, almost like a sister."

Do something for him! Of course I would. I promised, then and there, that I would raise his salary to any conceivable amount that a Spanish clerk could desire; which promise I have since kept, if not absolutely to the letter, at any rate, to an extent which has been considered satisfactory by the gentleman's wife.

"But, Maria—dearest Maria—"

"Remember, John, we are in the church; and poor papa will be waiting breakfast."

I need hardly continue the story further. It will be known to all that my love-suit threw in spite of my unfortunate raid on the button of the Marquis D'Almavivas, at whose series of *fêtes* through that month I was, I may boast, an honoured guest. I have since that had the pleasure of entertaining him in my own poor house in England, and one of our boys bears his Christian name.

From that day in which I ascended the Giralda to this present day in which I write, I have never once had occasion to complain of a deficiency of romance either in Maria Dagular or in Maria Pomfret.

### Scientific Notes.

**PHOSPHORUS IN PLANTS.**—Phosphorus is as necessary to the healthy development of plants as to that of man, but the mode and extent of its distribution varies considerably with circumstances. The young plant, if reduced to ashes, is found to be rich in phosphoric acid; whereas, after it has attained maturity, neither its stalks, leaves, grain, nor fruit contain much, though there are some cereals, such as peas, that are remarkable in their amount of constituent phosphorus. It is always found in combination with nitrogenous matter. Those organs of a plant not required to its sustenance which are destitute of nitrogen, are also without phosphates; the reproductive organs, the pollen of flowers and blossoms and the spores of the cryptogamia, are full of them. Marine plants also have an excess of them.

**WATER GAS.**—This gas, which is used in Philadelphia in the Gerard House, one of the great American hotels, is produced at a cost of 40 cents, or about 1s. 8d. per 1,000 cubic feet.

**MOUNT CENS.**—The magnificent road through the icy solitudes of the Alps, whereby the first Napoleon provided for the retention of his Italian conquests, proving inadequate to the commercial necessities of the day, a railway has been projected and partially constructed to connect Savoy and Piedmont. But this railway, advancing from Chambéry on the west and Lura on the east respectively, is incomplete, and terminates abruptly at the declivities of an intervening ridge, which opposes the connection of the two points, otherwise than by a tunnel of  $7\frac{1}{2}$  miles in length, and during most of this distance 2,600 feet below the surface of the mountain. Prodigious as were the labour and the expenditure implied in the enterprise, it was resolved upon, and on the 1st September, 1857, the King of Sardinia and Prince Napoleon were present at the first explosion, which signalled its commencement. Excavations like this, through solid rock, involve several operations, which are generally resolvable into three chief points: to break up the rock, to remove it, and to cut it out fairly to the exact form required. Now, from its exceptional position, it has been impossible to sink a single shaft in this gigantic tunnel to ventilate it, and facilitate the removal of the excavated material, which must thus necessarily be withdrawn from the openings of the tunnel, and it is easily to be apprehended how much this circumstance must enhance the arduousness of the undertaking. The longest tunnel ever yet constructed on any railway is less than three miles, and though it had many shafts, it occupied five years in completion. The motive power used to drive the tools into the rock and open holes to receive the powder whereby the rock is loosened, is compressed air; and this compression is produced by water. A column of water, 18 inches

diameter, gives an oscillatory movement, recurring every twenty seconds, and a force of several horse power. As at either extremity are large waterfalls, this hydro-pneumatic machine is specially applicable and convenient. The air used daily is 2,792,600 cubic feet, and this is compressed to one-sixth of its natural volume, being used at the pressure of six atmospheres. The work is carried on simultaneously at either end, advancing daily 20 feet, which is equivalent to about a mile yearly, and if this ratio be continued, there is no doubt that it will be completed within the seven years originally contemplated. The cost is estimated at somewhat less than £60 the forward yard for a double line.

### THE GOLD MINES OF CATA-BRANCA.

THE auriferous mountains of Cata-Branca are situated in Minas-Geraes, the richest and most populous province of Brazil. The name indicates the great variety of metalliferous earths which are found here. In addition to the gold, for which the district is chiefly celebrated, it produces diamonds, iron, copper, platina, mercury, and antimony. The ground is pierced in all directions by deep caverns, from which the precious ores are excavated, and hence the name of the gold mines, Cata-Branca, or White Cavern, is accounted for.

About the middle of the seventeenth century certain adventurers, who came from the interior of Brazil, brought to their countrymen and the Europeans on the coast news of the existence of precious stones, and especially of emeralds, in the district which they had traversed. Emulating the example of the Spaniards, the Portuguese prepared expeditions in search of these hidden treasures. The first emerald, together with other precious stones, is said to have been discovered by one S. F. Toucinho, in the Serra do Frio. A royal decree of the 27th of September, 1664, authorised him to continue his researches, but the death of one of his companions put an end to the expedition.

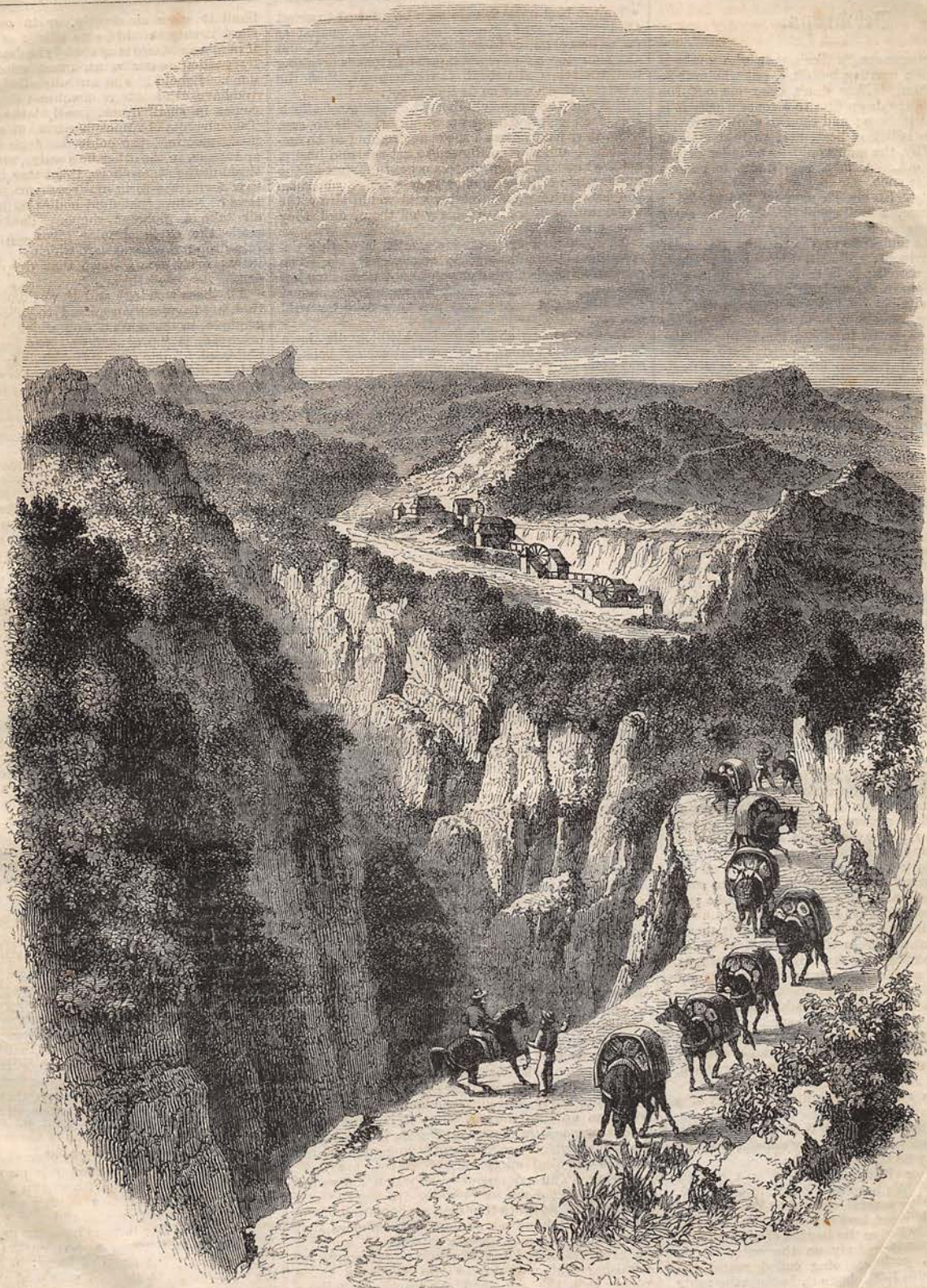
Another adventurer—an old man, of an iron constitution—offered to continue the search; and, in the course of the following year, he visited the district bordering on the Rio San Francisco. Here he found some emeralds, or stones which resembled them, for modern science throws a doubt upon this point. After an absence of seven years, he was joined in the search by his son-in-law, Manoël, who first discovered gold in Brazil. This latter event becoming known, the governor of St. Paul sought to compel the fortunate explorer to deliver up his tools, in order that excavations might be opened in the name of the king. A disturbance ensued, which resulted in the death of the governor, Manoël and his companions seeking safety in the deserts of the Rio Doce.

The inhabitants of the province of St. Paul made vain attempts to discover the gold which they knew lay so close to them. At length, after excavating the ground for thirteen years without success, they offered Manoël a paragon, on condition that he should disclose the spot where he had found the gold. He assented to the terms, and subsequently having been appointed governor of a fort at Rio Janeiro, he superintended the working of the mines.

From this period commenced a systematic search for gold throughout the district. Rodriguez Arzao, of Taubaté, is mentioned as the first who, in 1693, carried into that city some gold taken from the mines. In 1695 a body of men set out from the same neighbourhood in search of the precious metal. One of them—who had found the largest quantity—disposed of it to a colonel in exchange for a gun, who again bartered it for two female slaves with one of his companions. The latter was robbed of his precious acquisition by another of the party, who carried the gold to the governor, and having represented it as the result of his own discoveries, he was nominated Inspector-general of the Mint, then founded at Taubaté. A rivalry between this town and a neighbouring city occasioned a division between the bands of workmen, and from that time the discoveries of gold succeeded each other rapidly; first in the north, and afterwards in the central districts of Brazil.

As population became attracted to the sites of the gold discoveries, villages and towns sprung into existence, and by degrees the new province of Minas-Geraes was formed, the revenues of which greatly enriched the crown of Portugal. From the year 1700 to 1820, it is estimated that the gold mines of Brazil yielded a sum of about £35,000,000 sterling, the greater proportion having been contributed by this province.

In the present day the mines are no longer what



THE GOLD MINES OF CATA-BRANCA.

they were. Like the more modern gold-fields of California and Australia, the yield of gold gradually but steadily diminishes. It has hitherto happened, almost with the certainty of a law, that in every case on record the richest discoveries of gold have been made in the first instance, and when population has greatly increased around the site of the discovery, the precious metal has become so scarce that the people have been compelled to seek other and more permanent means of subsistence.

Surely the hand of Providence is here! Man has

been commanded to "replenish the earth and subdue it;" but the subjugation of wild and desert regions is a work of much toil, and pain, and difficulty, and would be a comparatively slow process, were it not for those discoveries of gold which tend so largely to promote emigration. Gold, however, is not wealth. It is only a soft, yellowish metal, which men have agreed to accept as the representative of food, raiment, houses, and lands. But the food, the raiment, the houses, and the lands are themselves to be obtained where the gold is found; and as the

supply of the latter diminishes, agriculture and the industrial arts are cultivated; and thus, at the present day, cities, provinces, states, of which the nucleus has been "digging" or a "placer," are coming into existence.

Such is the case with the mines of Cata-Branca. But little gold is now exhumed from the white caverns; but the culture of cotton, coffee, sugar, tobacco, and, in some districts, tea, is every day extending, and affords profitable employment to the two millions of persons who inhabit this province.