

Miscellaneous.

GEOLOGICAL EXPLORATION OF THE ISLAND OF TAHITI.

Monsieur Garnier, a French mining engineer, has lately made a geographical survey of the Island of Tahiti, the results of which are embodied in a report which is now being published in a French newspaper, *Le Messager*, printed at Papeete. So much interesting information is contained in this report, that we cannot resist the temptation to translate that which has already appeared, for the benefit of the readers of the *Times*.—[S. F. Times.]

The Island of Tahiti is the result of a series of volcanic eruptions, a fact easily established by the various strata of the discharged matter, or by the positions of the streams, whether of a remote or a recent date. These eruptions were not continuous, and we have proved that there have been long periods of uninterrupted tranquility, during which the island must have been traversed by water courses of considerable size. Hence it is probable that at this epoch a territory of comparatively wide extent sprang up from the sea, and re-clothed itself in vegetation, since there are to be seen in Queen Valley entire trees completely carbonized and covered by a layer of basalt. Animals, perhaps numerous, must have lived at that time, and we have had the good fortune to examine the remains of one of them, which was imbedded in a stratum of freestone, formed between two of these periodical eruptions.

Subsequently came the outpourings of basalt, trap, and all the scorious rocks, of which almost the entire island is at present formed. For a long time the molten mass ran over the country in torrents; it first filled the crevasses and smaller valleys caused by earlier outbursts, then cooled in regular layers, as is to be remarked at various points in Tahiti. These last eruptions, at length ceased in their turn, and the country assumed the appearance which it now presents; but what desolation reigned then upon the still hissing body of lava! No vegetation, no animal life and no water. Meanwhile the congelation which followed cleft the rocks in every direction; the waters penetrated the minutest fissures, and ran thence following the general declination towards the sea. The beds of the streams, changing with the lapse of time, grew larger and became at last the valleys which we see to-day. But many ages were necessary to consummate this great work; the surfaces of the rocks are long began to decompose under atmospheric action and furnished a soil of rare fertility, for it is a fact well established that this kind of volcanic production contains already all the elements necessary to vegetation; then bunches of flowers, plants and trees began to appear.

In the midst of that quiet the industrious zoophytes, which build the coral reefs, established themselves in large numbers upon the western coast, where the winds, prevailing from the south-east, never retard their labors by the dashing waves. From the time that a coral barrier was thus formed along the shore, all the pebbles and decayed vegetation, conveyed by the rivulets from the elevations in the interior to the coast, were deposited in the smooth sea in such a way as to form that belt of country, so regular and so fertile, which extends from the ocean to the base of the volcanic mountains. This territory, which rests in many points on the coral reefs themselves, has a breadth always greatest at the opening of the larger valleys, and decreases in approaching the points of land. Upon the eastern coast the sea is always more disturbed by the winds, and it has not permitted the corals to spring up so rapidly since the waves break upon the shore with such force as to materially affect the labors of the insects and prevent the formation of so large reefs as those which exist on the coast that is protected.

We will now set out from Papeete and make the tour of the island, following around the coast this belt of country, nearly level and of greater or less extent, formed in a manner that we shall observe, and upon which it was easy to build an elegant and convenient thoroughfare.

In leaving Papeete, and directing our steps towards the west, this strip of country is at first narrow and decreases in width as far as Cape Faaa, where it

ceases entirely. Before arriving at this point we noticed the quarry from which is taken nearly all the stone used for building purposes in the town. This is a sort of grey feldspar and contains little crystals of pyroxene augite. At Cape Faaa, the road is cut into the edge of a hill which borders upon the sea. Here is a red rock, which, in decomposition, produces a reddish clay mingled with greyish particles. In the midst of these clays are separate spheroids, harder, and in a less advanced state of decay. The same minerals are found at the village of Faaa. Here the level country expands, but beyond the town is again contracted. The road is a second time cut in the hills, the base of which is washed by the sea. These are composed of a red paste interspersed with crystals of augite. The decomposition of this rock furnishes red clay, readily formed into an inferior kind of bricks. The means employed in the manufacture of these are not, perhaps, such as the nature of the clay requires. The stone in its ordinary state is generally used in the construction of houses. It is easy to cut, and, as might be expected, has little durability. From Tournant Macheteau, the road threads a sandy plain as far as the village of Punaania. Along this part of the route, the mountains, although covered with a rich vegetation, presents very steep declivities, sweeping sometimes with a circular form.

At Punaania the river Punaruu runs through a basaltic trap and trachitic formation. Here the zone of level country is of considerable width, crossing the sands and the district of Paia. Several streams of water, varying in size, run through this section. The rocks which compose the beds of these are identical with those already mentioned. These rivulets correspond to the valleys, which are deep, well wooded, and of a peculiar character, enlarging as they run into the interior. The valleys are usually cut by a terrace, the height of which varies from thirty to three hundred feet. There the streams form a cascade. Above this the valley still extends, and a new cascade and another terrace interrupt its regularity.

At Mara, the mountains extend quite down to the sea, and present a circular and vertical notch about 450 feet in height. At the foot of this are two grottos, the first and most remarkable of which has a depth of 300 feet. This is filled with water of great depth, fed by numerous infiltrations that fall in rain from the walls of the cave, upon which the streams have deposited a layer of earth and lime, colored like the rose, probably by the action of vegetable matter. Within this grotto has the form of a half cone, of which the summit is the bottom of the cave, and its opening the base. The observer, standing at the entrance, thinks he sees the bottom of the cavern at a very short distance, and he is greatly astonished upon throwing a stone with all his strength, to find that the projectile, instead of hitting the end, barely reaches the middle.

From Mara to Papara and thence to Atamaorio, the interval mentioned gradually increases in width. At the latter point it attains the breadth of two miles. Here the magnificent plantations of M. Soares & Co. are established.

The valley of Maraoa opens into this estate, and we ascend it. The formation in this vicinity is not remarkable. One notices only, at certain points, the beauty of the crystals of pyroxene of augite, which are the base of all the rocks. The valley is remarkable for a very beautiful cascade and an amphitheatre about three and a half miles from the entrance.

From Atamaorio to Papenriri, the belt of level land retains its size. We stop at the last named village to visit the lake of Vaihira, which is situated at the higher end of the valley that opens into this district. The road which leads to the lake follows the bank of the river running between two mountains. The sides of these are often perpendicular, so that every moment, the cliffs on one side becoming impassable, the traveller is obliged to cross the stream. This, however, has a steep bank, and its bed is covered with round and moveable pebble stones which compel him to pay close attention to his steps, under pain of slipping, and falling into a rapid and tumultuous current. Going and returning this must be crossed one hundred and twelve times.

At the mouth the valley of Vaihira is large and has a fertile soil. At the end of a two hours' walk, this contracts,

and shows upon its sides a succession of terraces, with vertical walls, which are adorned by falls of water of greater or less volume. One notices, also, several cones, from three to six hundred feet in elevation, which frequently occupy the center of a grand amphitheatre, and sometimes separate the stream into two branches.

After five hours of fatiguing travel we reached a point where the river divides itself into two rapid streams, and a very steep declivity is before us. The two torrents which form the river are fed by the waters of the lake, but only by permeating the rock, for, as we shall see, this body of water has no outlet at the surface. We climbed the abrupt ascent before us, the ground being covered with a multitude of *fei*. We soon reached an extensive plateau, surrounded by lofty peaks, which is very fertile and preserves a strong vegetation. Having crossed this, ascended and descended the brow of a hill, we behold the Lake of Vaihira before us. This body of water is in a vast basin, in the midst of high mountains, open only on the side of the valley by which we approach. All the waters that strike upon the steep declivity, fall into the lake in the most beautiful cascades, the silver threads of which are in strong contrast with the sombre vegetation of the places obscured by the dark clouds that move slowly across the sides and above the summits of the mountains. It rains almost constantly at this point, which is occasioned by the condensation of the moisture of the sea breezes when they reach the peaks. The shores of the lake are almost inaccessible. The natives cross it by swimming, supporting themselves upon *fei*. It was by observing the time required to cross the lake that we got an idea of its extent. The swimmer was sixteen minutes, and moved at the rate of 100 feet a minute, which amounts to 1,600 feet. A bullet, shot horizontally, after ricocheting several times, nearly reached the opposite cliff, and we estimated that our rifles would carry a ball almost 600 yards. For the depth, which is said to be very great, we have the following soundings:

12 feet at a distance of 45 feet from the shore.			
24	"	75	"
30	"	100	"
27	"	120	"
30	"	120	"

From the latter point, the depth did not vary materially from thirty feet. The bottom is muddy. The shallowness and uniform depth is easily accounted for, since all the particles worn off by the overhanging cliffs, the sand and rocks, unable to run off, sink to the bottom. At a period not far distant, this will reach the elevation of the banks, and there will remain only a marsh, which will force its waters over the crest mentioned, directly into the valley. At present, thanks to this lake, the level of which rises in the rainy season and falls during dry weather, the cultivated lands in the valley of Vaihira are protected alike from inundations and drouths. When the lake shall turn its waters directly into the valley, the fields which it irrigates, not having the same uniformity of moisture, will greatly depreciate in value.

We sounded it at a few points, and, as we have shown, found a remarkable regularity of depth, but it is probable this reaches its maximum in those places where the infiltrations are the most copious.

The rocks which compose these mountains are mainly pyroxenic, and identical with those we have remarked before. The bed of the lake has not, as some have thought, the appearance of a crater. Indeed, the utter absence at this point of lava, scorice and cinders, leaves no room for the idea that this inverse cone is a crater.

EXCAVATION AT THE LOUVRE.—Excavations are going on in the court of the Louvre to ascertain the site of the foundations of the fortress built by Philip Augustus, the plan of which had been nearly reconstituted from a minute examination of a considerable number of printed documents. Such was the precision of the orders given to the workmen, that at the very first strokes of the pickaxe the trench was discovered which corresponded to one of the principal entrances. By continuing the line, the workmen soon reached the foundations of the two towers flanking that entrance. These towers were constructed of excellent stone, well hewn, and in a perfect state of preservation.

THE CINCINNATI SUSPENSION BRIDGE.

—Yesterday, the greatest work in the country, the Covington and Cincinnati suspension bridge, was thrown open to the public. During the day, according to the money counted at each end, about 40,000 persons walked over and back to view this mammoth structure, admired symmetry and beauty of the immense work, and view in every direction the fine panorama of the three cities, Cincinnati, Covington, Newport and their suburbs, and the beautiful river above and below.

GAS FROM COFFEE.—A remarkable communication was made by M. Babinet at the last meeting of the Academy of Sciences, on the evolution of gas in the process of making coffee. If cold water be poured on roasted coffee, finely ground, such as is generally used with boiling water, a considerable quantity is generally evolved, about equal in volume to the amount of coffee used. If a bottle be half filled with this ground coffee, and cold water be then poured in until the cork is reached, which is to prevent the escape of the gas, a violent explosion, sufficient to force the cork out of the bottle, or even to break the latter, will result.

REMAINS OF EXTINCT ANIMALS.—

Mr. Alvord, Marshal of Idaho Territory, called upon us yesterday and showed us a mammoth tooth which had once belonged to a monster of vast proportions. The specimen is one of three found in the same place, one of which weighs over nine pounds. The one shown us weighs eight and a half pounds, is about eight inches long without the roots, which have decayed and are missing, three inches in thickness, and not less than seven inches in width. It was found on Salmon river, about four miles above the mouth of State creek, Idaho, at a depth of 60 feet from the surface and ten feet from the bed rock. Bones were also found which evidently belonged to the same animal, one of which, supposed to be a thigh bone, was at least a foot in diameter. These latter, when exposed to the air, crumbled, but the teeth are petrified and in a good state of preservation. The tooth shown us indicate that the animal belongs to one of the herbiferous tribes. If he were as large as we may readily suppose from this tooth, it would require a small forest to make him a moderate breakfast. He probably belonged to the same age as the mammoth trees in California; if so, it is easily understood why the trees grew so large—they were obliged to do it in self-defense. —[Portland Oregonian.]

THE METEORIC SHOWER IN SPAIN.

—The correspondent of an English paper, writing from Saragossa, November 15th, says: For several weeks past the sky in this part of Spain has been without a cloud, and consequently the display of last night was received under circumstances which could only very rarely occur in England. My attention was first directed to the falling stars at about 12 o'clock at night, by observing groups of people in the narrow streets of Saragossa, conversing together with a certain degree of excitement. "*Mira usted es como si fue en el tiempo del sitio*" (Look, it is just as if it were in the time of the siege) was the reply to my question as to what was the matter, and on looking up the appearance certainly was as if the city was being shelled. Showers of meteors seemed to be pouring into the place, a score or more at a time exploding with a brilliant flame at different points, and leaving long luminous trains behind them, some of which lasted as streaks in the sky several instants after the explosion of the meteor. I hastened to an open space, and I much regret that the sight I witnessed did not fall to the lot of a scientific observer. The meteors seemed to be most abundant towards the north and northwest, and I noticed a particular stream of them not far from the constellation of the Great Bear. Some idea may be formed of their number and brilliancy from the fact that when I went to bed, though the field of sky visible through my window as I lay was very small, it was being continually crossed by the meteors, and a looking glass which hung on the wall was every moment brilliantly lit up with the reflection of the explosions which occurred. During the short time I observed them many hundreds of meteors fell, and, as there was no perceptible diminution in their number, I have no doubt during the night the number must have been tens of thousands.