of the circumstance, (together with any remarks you may be pleased to subjoin,) in the *Quarterly Journal* of the Institution, might in some measure excite your Country Correspondents to a more zealous investigation of the Antediluvian Relicts of this portion of Southern Africa.

I have the honor to be,

Yours, &c.

Veranda Lodge, Green Point,
24th Sept. 1830.

Remarks on the Mineral Springs at the Koogha; in a letter to John Arthur, Esq. M. D. By Dr. MAIR.

SIR,—I have the honor to submit, for your consideration, the following remarks on the Mineral Springs at the Koogha; but I deeply regret that the want of chemical apparatus prevents me from analizing the waters, and transmitting a more finished account of their composition and qualities.

Several Mineral Springs are found on the farm of Mr. Niekirk, which receives its name from its situation on the western bank of a small river the Koogha, and is about ten miles distance from Uitenhage and twenty-five from Port Elizabeth. The country for many miles round is composed of strata of clay and lime-stone, with occasional tracks of sand.

The rocks are chiefly of primary formation, presenting, particularly towards their summits, large irregular masses of quartz and granite.

A conical-shaped hill rises from the western bank of the Koogha with a very gradual slope, near the base of which an irregular mass of unctuous clay of a deep black color, in some places striped with red and yellow veins, and presen ing something of the appearance of an accumulation of mole hills, opens to the view. Upon arriving at the spot, a strong sulphurous odor is perceived, which increases in intensity as you proceed. The surface of the black clay is in many parts crusted with a whitish lamina of a glazed appearance, and likewise with small yellow crystals, both of which are chiefly sulphate of iron. Near the upper part of the mass two springs are discovered a few yards from each other.

The one placed higher up the ascent is of the medium temperature of the atmosphere, and rises from a sandy bed about six feet from the surface, in large quantity, and with a gurgling sound. The water is covered with an ochry crust, and is beautifully transparent when it is removed. The sides of the well

are formed of a compact of dark brown clay intermixed with portions of a white and black color, and there is a polished surface which tastes acid. The water drawn from this well has a perceptible chalybeate flavor. It strikes a purple color with infusion of Galls, but is not altered by blue vegetable infusion, ammonia, nitrous acid, or lime-water.

The other spring is found in a hole about six feet deep, from under the western bank of which the water chiefly rises out of a hole of small circumference, opening into the larger one.

The walls of this spring are of the same description as the surrounding black clay, are unctuous to the touch, and when a little is applied to the tongue tastes strongly acid. The water is muddy, and when taken from the spring and allowed to stand deposits a copious dark brown sediment. It soon undergoes decomposition when removed from the spring, and then emits a strong smell of sulphuretted hydrogen. The bottom of the well is sandy. The water has a strong acid and astringent taste; turns of a deep purple color upon adding infusion of galls, and is perceptibly reddened by blue vegetable infusion. Both these changes take place in almost an equal degree after boiling the water. Nitrous acid, ammonia, and lime water, produced no change. I think it is probable, from the black clay being, as correctly as I could ascertain, only about six feet deep, and the bottom of the well sandy, that the water becomes impregnated with the salts of iron after it springs from the bowels of the earth, by remaining in contact with the clay.

The temperature of this spring, ascertained by repeated experiments, is 86° F. Perhaps the heat may be occasioned by the decomposition of the pyrites, and the change of the acid from a solid to a fluid state giving out caloric. That the cause of the increase of temperature is very confined in its sphere, seems evident from the contiguous spring being of the natural temperature.

The production of the sulphate of iron found efflorescent on the surface of the clay, is most probably owing to a large quantity of pyrites in the soil, the sulphur of which receiving oxygen from the atmosphere is converted into sulphuric acid, and unites with the oxide of iron; while perhaps another portion of the sulphuric acid combines with the alumine, and a proportion of potash produced by the decomposition of vegetable matter, and composes alum.

The proprietor of the ground says that the black clay has been gradually increasing in quantity for several years, so that where there was once a hollow there is now an eminence. Can this circumstance serve to assimilate this remarkable natural phenomenon in any degree to a mud volcano?

On the south-east side of the hill, near its summit, a most extraordinary appearance presents itself: a beautiful stream of limpid water, gushing from the side of a romantic rock incrusted with stalactites, covered with a natural ceiling, and falling into a semicircular basin in a natural cascade. The roof, which projects beyond the spring, is composed of richly variegated pudding-stone with a polished surface disclosing a fine variety of tints, and an intricate diversity of structure. To obtain access to the fountain, it is necessary to step into the basin or reservoir for receiving the water, and bend under the shelving part of the rock. A rude semicircle with breaks in its segments, is formed by a continuation of the same rock, possessing the same beautiful polish, with abrupt projecting points. The spring is thus protected by encircling arms, and forms itself into a crystal rivulet, which pursues its course along the luxuriant declivity adorned by a variety of plants and shrubs. A stratum of iron-stone extends on each side along the little stream, at some distance from it, and between these strata are observed masses of different sizes, composed of quartz imbedded in iron and sand stone. The water from this spring is of a chalybeate taste; is not changed by vegetable blue infusion, but turns of a dark purple on adding infusion of galls. Nitrous acid has no effect on it. The sides and base of the hill, and the adjacent country for several miles round, are thickly strewed with pieces of cellular iron stone, which, perhaps, were projected from the crater of a volcano which may have once existed in this place.

M. Condamine says, "Whenever I see on an elevated plain a circular basin surrounded with calcined rocks, I am not deceived by the verdure of the adjacent fields, I can discover beneath the snow itself the traces of an extinguished fire. If there is a breach in the circle, I usually find out by following the declivity of the ground, the traces of a rivulet or the bed of a torrent. If the circumference of the basin has no break, the rain and spring waters which are collected there, generally form a lake in the very mouth of the volcano." This passage from Condamine almost literally applies to the ground I have been describing.

Should this have been a volcanic mountain, and appearances are strongly in favor of that hypothesis, perhaps we have little reason to expect great variety of mineral substances in its neighbourhood. To illustrate an undetermined point in Mineralogy, is, however, an object of importance, and boring and mining, if judiciously conducted, might bring to light substances of profit and utility.

The quantity of sulphate of iron which could be procured,

might be of some consequence, and the various colored clays might be converted into pigments.*

In regard to the medicinal virtues of the different springs, I regret that I have little of a satisfactory nature to communicate. The warm spring has been employed as a bath in three cases of chronic rheumatism, two of them very obstinate and of long duration, but without any marked advantage. It has likewise been used in a case of fistula in ano, which had frequently been operated on, without any good effect.

Perhaps these were not cases in which the water was likely to be very beneficial. My anxiety to discover any thing that could allay the sufferings of humanity incited me to recommend the trial.

The proprietor mentions several cases of cutaneous disease, particularly tinea capitis, and likewise of indolent and foul ulcers, which were speedily cured by the external application of the warm water. The cold chalybeate springs may be serviceable in the class of diseases in which they are indicated.

In concluding, let me solicit your indulgence toward this imperfect outline, which, if it should induce you to encourage the prosecution of the inquiry, will fulfil my most sanguine hopes. I have the honor to be,

Your's, &c. &c.

Port Elizabeth, 14th March 1826.

Messrs. Cowie and Green's Expedition to Dela Goa Bay.

[Communicated by Mr. Chase.]

An outline of the incidents which occurred during the adventurous and fatal enterprize of Messrs. Cowie and Green, in their journey to, and return from, the Portugueze Settlement at Delagoa Bay, overland, has been already given to the public as a part of a more extensive work in progress, on the Discoveries made in the interior of the African Continent from this Colony.

The following account of the death of the directors of the expedition and of their faithful Hottentot servant, Jantje, is taken nearly verbatim from their Caffer interpreter, Jacob, who accompanied them, and was present during the excursion.

* The circumstances narrated indicate a formation by deposition from the spring, rather than by volcanic agency.—Eds.