XXII. *Memoranda relative to the Porphyritic Veins, &c. of St. Agnes, in Cornwall.*

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[Read December 3rd, 1813.]

I HAVE drawn up the following remarks on the rocks in the vicinity of St. Agnes, in Cornwall, almost wholly from the notes of my friend and fellow-traveller, Mr. Buckland, an accident having prevented my accompanying him to the most interesting spot mentioned in them.

It is well known that a considerable mining district takes its name from this small town, which is situated on the coast about eleven miles north-east of Truro. The lodes are principally worked for tin, though copper is occasionally raised. The prevailing rock is killas, and the nearest point at which granite has been noticed is in the Gwennap cluster of mines about six miles distant. Having observed in the walls of the neighbourhood several specimens of those porphyritic and granitic rocks, which are distinguished in the country by the name of elvans, we were induced to enquire more particularly into their Geological relations, and the frequency of small promontories on the coast afforded us a favourable opportunity of ascertaining their position in several spots.

Between St. Agnes and Cligga point, (a considerable headland about four miles to the east of it) no less than five of these promontories occur, each of which is traversed by a dyke of elvan,

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running nearly due east and west, and varying in a manner apparently capricious, both as to its thickness and inclination. The appearance of these dykes will be best understood by reference to the annexed drawings,* which are faithfully copied from sketches made on the spot by Mr. Buckland; nor can I describe their general character better than in the language of that gentleman. "The elvans all along this coast occur in beds and veins of every possible thickness, from forty feet to half an inch, sometimes overlying, but more frequently traversing the killas in various directions, under such circumstances as are apparently irreconcilable with any other theory than that which supposes them to be of contemporaneous formation with the rock containing them, the result of some play of affinities which allowed a part of the mass to assume a crystalline texture, while its coarser and more abundant portions were left to arrange themselves in the slaty or tortuous form which characterizes the killas." These elvans are for the greater part of porphyritic structure, the base being in most instances a very minute aggregation of quartz, pale chlorite, and possibly some felspar: the first of these is usually the predominant ingredient, the imbedded substances are felspar, quartz occasionally crystallized in small double hexagonal pyramids, and chlorite in small patches. In one quarry, a little to the west of St. Agnes, we found the same variety of elvan passing (by the addition of tourmalin, and the decrease or loss of all its ingredients excepting the quartz) into a rock much resembling that of Roche, in the same county. At Cligga Point itself besides the elvan, we observed a small formation of what would probably be considered by the Wernerian school, as the newer granite, incumbent upon the schist at an angle of at least 80 degrees. Its singular stratification will best be understood from

* Pl. 23.

the drawing annexed.* It has been much worked for tin, which is disseminated through its mass in veins apparently contemporaneous.† The killas which is traversed and covered by these more crystalline rocks, has, for the most part, the characters usually ascribed to clay slate, and its strata occasionally present singular curvatures; in many places it passes into chlorite slate, and in the immediate neighbourhood of these dykes it usually presents either a highly crystalline form of that rock, or such an intermixture of it with quartz and felspar as might fairly be esteemed a variety of gneiss. This change of appearance has it is well known been attributed by the most able advocates of the Huttonian theory to the action of the injected mass, while yet in a state of fluidity. To us, the aspect of the rock at the point of contact did not, (either in this or any other instance of the same phenomenon, which fell under our notice), appear to be such as we could conceive to have resulted from that process.

We were in almost every instance strongly tempted to regard the elvans as of contemporaneous formation with the schistose rock which they traverse. We are conscious however that our observations were neither sufficiently accurate or extensive to warrant the advancing any thing like a decided opinion upon this curious subject.

* Pl. 23. Fig. 1.

† I have thrown into a Note the description of three specimens from different points of this headland.

1st. Small grained granite with earthy felspar, containing imbedded crystals of flesh-coloured felspar.

2d. The same, but with little mica, and the felspar somewhat less earthy.

3d. A granite composed of middling sized grains of white vitreous quartz, light flesh-coloured felspar, and a comparatively small quantity of dark brown mica.

These, with several other specimens from the same quarter, are deposited in the cabinets of the Society.

Cligga Point, 4 Miles East of S^t Agnes, Cornwall, north coast.

Granitic Rock resting on Killas forms nearly the whole promontory.

Killas

Dyke of Porphyritic Elvan traversing the Killas.

Drawn by the Rev^d H. Conybeare: from Sketches by Professor Buckland

Eastern View of the third Cove East of S^t Agnes.

Porphyritic Veins in the Killas Rocks of S^t Agnes Cornwall

Eastern Promontory of the first Cove East of S^t Agnes.

G. Cooke Sc.