

versed in the science of geology to offer any specific theory to account for the appearances I have described: the cliffs were rent and cracked in a thousand different ways, and taking into consideration their strange and wrecked appearance, together with the fact that lightning is known to vitrify sand, may we not thus get a clue to the real agency by which these results have been produced?*

February 10.—The weather was thick and gloomy, and it rained fast; but, having completed our survey and observations, and the wind being favourable, it was resolved to get under weigh without further loss of time.

In the very act of weighing, the ship's keel grazed a sunken rock, of the existence of which, though we had sounded the bay, we had been, till that moment, in ignorance! He only who has felt the almost animated shudder that runs through the seemingly doomed ship at that fearful moment, can understand with what gratitude we hailed our escape from the treacherous foe.

In passing out, we named two low small rocky islands, lying north of Point Swan, and hitherto unhonoured with any particular denomination, the

* Since this was written, I have consulted my friend, Mr. Darwin, who has kindly examined a specimen I brought away. He pronounces it "a superficial highly ferruginous sandstone, with concretionary veins and aggregations." The reader should, however, consult Mr. Darwin's work on the 'Geology of Volcanic Islands,' p. 143.

not be necessary for me to say anything about them, further than that they are composed of a trap-like compound with an aspect of serpentine, and that either on them or the Northumberland Isles, sandalwood has been found of late, and taken by a Tasmanian vessel to the China market. Just before dark, the soundings decreased to 29 fathoms, Pine Peak of Percy Group, bearing S.W. 10 miles. Our course was now shaped for Cape Gloucester, the extreme of the Cumberland Isles; and about this time we felt the flood tide setting S.W. by W. nearly a knot an hour, a sure indication of there being openings in the barriers in that direction. The great distance at which this part of it lies from the islands will render its examination a difficult and hazardous undertaking. The night was anything but favourable for sailing among islands, being very hazy, with passing rain squalls. At midnight we passed nearly two miles from the N. E. side of k. of the Cumberland Group, in 27 fathoms, in which depth we continued till getting abreast of Pentecost Island, the next evening, the 24th, when it increased to 35 fathoms, but still on the same kind of green sandy mud bottom. At 10, p.m. we passed about seven miles from Cape Gloucester, which at that part was nearly 1600 feet high. Yet the night was so hazy, that it was only visible at intervals. Here we noticed many rippings which we afterwards found indicated a N.N.W. current of a knot and a half

an hour, caused no doubt by the proximity of a part of the barrier, the distance between it and Cape Gloucester being only 13 miles. I may here observe that the barometer was very high with these fresh S.E. winds and hazy weather, and rather low during the light N.W. winds we experienced in the neighbourhood of Cape Capricorn.

June 25.—At daylight the Beagle was a few miles east of Cape Upstart, in 17 fathoms, having passed two miles from the north side of Holborn Island, in 28 fathoms. The above headland received its name from Captain Cook, and peculiarly deserves it, appearing in fact from the lowness of the land behind, actually to start up out of the water.

Chronometers being chiefly affected by changes of temperature, it was necessary to ascertain the rates of those in the Beagle again before reaching Port Essington, for a correct measurement of the difference of meridians between that place and Port Stephens. The bay on the west side of Cape Upstart had been recommended by Capt. King for that purpose, as he had considered it likely to be the mouth of an opening. This conjecture the low land in the head of the bay, together with a singular break in the distant hills seemed fully to justify. We accordingly entered the bay and anchored half a mile within the N.E. point. This took us till the afternoon to reach, in consequence of our having a light land breeze until

3, P.M. when it became steady from N.E., drawing round to south, after sunset, and veering to S.W. again in the morning. This alternation of land and sea breezes continued during our stay, for three or four successive days.

In the evening we landed and ascended the N.E. extremity of the Cape, from whence we saw at once that hopes of discovering any opening were delusive, the low shores of the Bay could be traced all round, except in the N.W. corner, where a point shut out our view.

On sweeping the western shore with a spy glass, I discovered the mouth of a river about a mile to the north of a hillock marked in Captain King's chart. This river was made the object of an exploring party, and next day Captain Wickham and Lieut. Eden, went on that interesting service. It has two entrances, both very shallow, and is of little importance, being on a lee shore and fronted by a bar, which seems to break at all times of the tide. However, as there is such very safe anchorage near, the discovery may hereafter prove of some value. Captain Wickham found it fresh ten miles from the entrance, but at that point it is nearly lost in the sands, and so very shallow that the natives have a fishing weir across it. The land, which appears to be much cut up with creeks, is very flat on both sides, and is subject to inundations. This was evident from the signs of drift, to the height of six

feet, on the trees that grew along the banks, themselves not more than a couple of yards above high water mark.

The exploring party saw a few natives, but they were too shy to communicate. One was discovered on a long flat, crawling on his hand and knees, to catch a glimpse of the strange intruders, and looking more like a great insect than a man. In the distance up the river a good many smokes appeared; but I doubt whether this may be considered as denoting a densely populated country, as fires are kindled by the Australian natives, both as signals and for the purposes of hunting.

Previous to my departure from England, I had the pleasure of hearing a valuable paper by my friend Mr. Darwin, on the formation of coral islands,* read at the Geological Society; my attention being thus awakened to the subject, the interest of this important paper was to me greatly enhanced by a series of queries, kindly furnished by Mr. Darwin, and drawn up with a view to confirm or invalidate his views, his purpose being to elicit truth from a combination of well attested facts, and by inducing the research of others to further the objects of science.

Among these queries was the following:—"Are there masses of coral or beds of shells some yards above high water mark, on the coast fronting the barrier reef?"

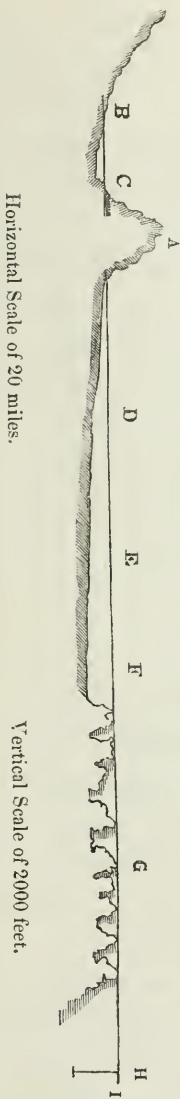
* See also the Hydrographer's Instructions, *supra*, p. 21.

Captain King, in answer to the above states, that some of the islands within the reef have beaches of broken coral; and, as an instance, he refers to Fitzroy island.

I will, myself, here adduce what may be deemed an important fact; and which, if allowed its due weight, will go far to weaken the arguments brought forward in favour of the subsidence of the N.E. coast of Australia. I found a flat nearly a quarter of a mile broad, in a quiet sheltered cove, within the cape, thickly strewed with dead coral and shells, forming, in fact, a perfect bed of them—a raised beach of twelve feet above high water mark. On the sandy beach fronting it, also a few feet above high water mark, was a concretion of sand and dead coral, forming a mass about fifty yards long. Fronting this, for about the width of one hundred and fifty feet, was a wall of coral with two feet water on it; and immediately outside, five fathoms, with a fine sandy bottom, slightly sloping off. The annexed woodcut will better explain what we have here endeavoured to bring before the reader.

This small coral-strewed flat where our observations were made, and the results of which are as follows; lat. $19^{\circ} 42\frac{3}{4}'$ S.; long. $15^{\circ} 36\frac{1}{2}'$ E. of Port Essington, is surrounded by an amphitheatre of hills. Had it been on the seaward side of the Cape, I might have been readier to imagine that it could have been thrown up by the sea in its ordinary action, or when suddenly disturbed by an earthquake wave; but as the contrary

A. Cape Upstart, 2000 feet high.—B. Bay within 3 fathoms deep.—C. Raised bed of coral and shells, 12 feet high.—D. Depth 17 fathoms, fine grey sand and shells.—E. 27 fathoms, grey sandy mud or marl, which after exposure to the air becomes very hard.—F. 32 fathoms, coarse sand.—G. Great Barrier Reef, outer part uncertain, being taken from the width of it near—H. No bottom, with 200 fathoms.—I. Level of sea at high water; rise of tide 7 feet.



SECTION OF THE N.E. COAST OF AUSTRALIA AND GREAT BARRIER REEF.

is the case, it seemed impossible to come to any other conclusion, than that an upheaval had taken place. The whole of Cape Upstart is a granite mass, and its crests are covered with boulders, some of which have rolled down and form rather conspicuous objects on the shores and points of the bay.

Near the N.W. extremity of the Cape just at high water mark, I noticed some pumice stones, small and not having the appearance of belonging to a recent eruption, which seems to agree with the opinion expressed by the Rev. W. G. Clarke in the *Tasmanian Journal*.

He considers, and I think justly, that its origin may be in the Solomon, New Caledonia, or some other of the volcanic islands to the east of

Australia, from whence it drifted, as it has been found on all parts of the coast, to the southern portion of which it has doubtless been carried by the current. Captain Wickham did not remark any above the entrance of the river he explored, on the western side of the bay, which bears out the opinion I have above expressed. A curious fact, mentioned by Mr. Clarke is, that one piece, perfectly water-worn, was found upon a high mountain, full twenty-five miles inland from the mouth of Clarence River. Was this carried thither by one of the natives, or does it indicate that pumice drifted to this part of the continent at a time when, if ever, it was on a level with the ocean? I further remarked in this place, many of the land shells common to this and other parts of the coast.

There was great difficulty in attaining the loftiest point of the Cape, which I found to be two thousand feet high. From thence our party commanded a view of the whole of the bay, and discovered that we were, strictly speaking, standing upon an island, a small creek winding round the southern foot of the high land, and connecting the bays on the eastern and western side of Cape Upstart.

The break in the hills seen by Captain King, and supposed to indicate an opening, has been already alluded to. On reaching the summit I found that this was merely a valley, containing the head of the plain which stretched from the shores of the bay. On its southern side rose Mount Abbott; but one

of the most remarkable features on the coast is Mount Elliott, lying about forty-five miles W. and by N. from our position. It is a long level hill, with a peak at its northern extremity. All those in the neighbourhood, as far as I could judge with the spyglass, seemed to be of the same formation with Cape Upstart.

We found this a convenient stopping-place for vessels making the inner passage, wood and water being easily procured. The latter is found in a considerable reservoir fed by two streams from the high land of the Cape, lying a mile within the mouth of the bay. From appearances, I should say it would yield an abundant supply at any season of the year.

There were a few natives loitering about on Cape Upstart when we arrived; and I think we should have communicated with them had it not been for the fright into which they were accidentally thrown. A boat's crew on landing surprised a small party, which instantly dispersed in various directions. A lad, however, instead of escaping with the rest, stowed himself away in a crack between two boulders of granite. Every endeavour was made to get him to come out of his hiding place; biscuit was offered him, but he snapped savagely with his teeth at the hand that held it. Finding all attempts fruitless he was left; and no doubt, the account he gave his comrades of us, while under the influence of fright, was sufficiently terrible to take