

The tufa and basaltic conglomerates have few peculiarities. The latter are like those of Tutuila, (page 311.) The tufa is a very fine-grained earth-coloured rock, without lustre, and fragile. It is abundant at the eastern extremity of Upolu, and in the adjacent islands, and will receive farther attention on a future page. A variety of a brick-red colour, sprinkled with white points (feldspathic) is used as a paint by the islanders. I have not seen this variety in place, and have suspected that it may be decomposed rock proceeding from the second variety of porphyritic basalt (var. 6, b.) The dissemination of the whitish points is very similar to that of the feldspar in this rock. The tufa resembles a red ochre, and owes its colour to iron.

*Structure.*—*a.* A lamellar structure characterizes the rock in some of the cliffs. Just west of Laulii, this structure is finely developed; the rock (var. 4) is divided into layers from half an inch to a foot in thickness. The layers separate with difficulty, although very distinct on the broken surface of the cliff. The layers are often contorted or curved.

The same structure, I am told, is exhibited by recent layers of the black lava, on the south side of Upolu. Layers from an inch to six inches thick, are slowly cleaving off from the roofs of some of the caverns in that part of the island.

*b.* A concentric structure is not common in the basalt and basaltic lavas of the island. Three miles east of Apia, along the coast, this structure is imperfectly developed. The centres of the concentric masses have a dark greenish-black colour and are compact. The rock adjoining the central mass is altered to an ochre yellow or reddish-brown colour; the latter is the external colour of the two, and is apparently the result of a farther decomposition and a more complete development of the iron in the constitution of the rock. This structure may be seen at other places along the shores; but I have observed no additional facts respecting it worthy of note.

*c.* Columnar basalt, though common in imperfect forms, is still, according to our observations, of rare occurrence in regular prisms. In the high peaks around Fangaloa the same vertical cleavages may be detected as in the hills of Tutuila. Some of the thin layers of basalt, or basaltic lava, along the coast, are broken, by perpendicular fractures, into columnar masses, from two to five feet in breadth. The fractures generally produce curved surfaces, and the masses or columns stand half an inch or an inch apart.

Along the rocky coast beyond Laulii to the eastward, the surface