

of the basalt is occasionally divided by irregular fractures into small polygonal areas, six to twenty-four inches across, and these areas, owing to the filtration of some cementing material into the fissures, are separated by double walls, like the fissured sandstones of Australia. The wear of the surface has left the harder walls prominent, and the appearance is much like that of the sandstone referred to. The infiltrating fluid may have contained silica.

Stratification.—In this place we make a few remarks only on the older rocks of the central district, reserving many facts respecting the more recent basaltic lavas and tufas, till we have described the several craters of the island. On the shores, where alone the rocks are exposed to view, the basalt occurs in a series of layers, which appear to have been formed by successive flowings of the melted rock. The layers average ten feet in thickness, and are partially separated by small rugged caverns and blow-holes. The layers are nearly horizontal, or have a very gradual dip outward, not exceeding five or six degrees. These are the ordinary characters of the rock between Laulii and Tiavea. Just east of Laulii the cliff is partly composed of a basaltic conglomerate. A layer ten feet thick intervenes between the two layers of basalt forming the cliff. The conglomerate consists of rounded and ragged masses of basalt, cellular or compact, imbedded in a fine earthy base, often of a reddish clayey aspect. At the rocky point, just west of Laulii, the same layer of conglomerate extends down to the surface of the water.

Dikes.—The only dikes observed among the older rocks of the island occur in the point east of Fangaloa Bay. There are two at this place;—one follows a southeasterly direction, and dips 80° to the southward and eastward: it is about twenty inches wide. The other is two and a half feet wide, and is mostly vertical: it follows nearly the same course with the preceding. The small number noticed by us, is no evidence that the number may not be large: the rocks are rarely exposed for observation on this thickly-wooded island.

3. EXTINCT CRATERS OF UPOLU.

We describe separately the facts that have been collected respecting the *eastern* and *western* volcanic districts of Upolu.

Western District.—This district includes one half the island of Upolu. The principal craters are situated along the summit of the