

## VII. DRIFT SAND-ROCK.

Still another kind of beach formation is going on in some regions through the agency of the winds in connection with the sea. It occurs only on the windward side of islands when the reefs are narrow, and proceeds from the drifting of the sand into hillocks or ridges by the winds.

The drifts resemble ordinary sand-drifts, and are often quite extensive. On Oahu, they occur at intervals around the eastern shores, from the northern cape to Diamond Point, which forms the south cape of the island,—the part exposed to the trades; and they are in some places twenty to forty feet in height. They are most remarkable on the north cape, a prominent point exposed to the winds that blow occasionally from the westward, as well as to the regular trades. They also occur on Kauai, another of the Hawaiian Islands. But at Upolu (Samoa), where the protecting reefs are broad, the author met with no instance worthy of mention.

These sand-banks, through the agency of infiltrating waters, fresh or salt, become cemented into a sand-rock, more or less friable, which is frequently oolite. The rock consists of thin layers or laminæ, which are very distinct, and indicate, generally, every successive drift of sand which puffs of wind had added in the course of its formation: and where a heavier gale had blown off the top of a drift, and new accumulations again completed it, the whole history is distinctly displayed in the rock. Several catastrophes of this kind may be made out from the character of the lamination in the sand-bluffs on the north side of Oahu. Since their formation, this island has undergone an elevation of twenty-five or thirty feet; these hills, once on the shores, are now seventy feet above the level of the sea, and they face the water with a bluff front (due to degradation), in which the lamination is finely exposed to view. The layers are but a fraction of an inch; at one of the hills large slate-like slabs may be obtained; they have a sanded surface, but are so hard within as to clink under the hammer.