

origin of the physical outlines of the country. As to the fact that no marine shells have yet been discovered in the conglomerate, sufficient search has not yet been made for them to entitle us to found an argument on such negative evidence. At the same time I confess, that, having found sea-shells and bryozoa abundantly in certain elevated marine conglomerates in the Grand Canary, before I visited Palma, and being unable to meet with any in the Barranco de las Angustias, I regarded the old gravel when I was on the spot as of fluvial origin. Such inferences are always doubtful in the absence of more positive data, and the intervention of the sea will unquestionably account for some phenomena in the configuration of the Caldera and Barranco more naturally than river action. For example, we have the lofty cliff *E*, fig. p. 504, already mentioned, and *c, f*, map, p. 494, extending four or five miles from the Caldera to the sea on the right bank of the Barranco, and no cliff of corresponding height or structure on the other bank, where for miles towards the southeast there is the platform *F*, fig. p. 504, supporting several minor volcanic cones. The sea might be supposed to leave just such a cliff as *E*, after cutting away a portion of the southwestern extremity of the old dome-shaped mountain in the north of Palma, whereas a torrent or river would leave a cliff of similar structure and nearly equal height on both banks. As to the fact of the old conglomerate ascending an inclined plane, *i, l, k*, p. 497, from the sea-level to an elevation of about 1500 feet, near the entrance of the Caldera, this is by no means conclusive in favor of fluvial action, although some elevated patches of the same may in truth belong to an old river-bed; but in South America gravel-beds of marine origin have a similar upward slope, when followed inland, and the cause of such an arrangement has been explained in a satisfactory manner by Mr. Darwin.\*

Another argument in favor of marine denudation may be derived from that peculiar feature in the configuration of Palma, before alluded to, called the pass of the Cumbrecito (*e*, fig. 646, p. 497), forming a notch in the uppermost line of precipices surrounding the Caldera. This break divides the mountain called Alejanado, *d*, fig. p. 497, from the eastern wall *c, f*, and cuts quite through the upper formation; yet the range of precipice *f, e*, on the eastern side of the Caldera is continued uninterruptedly, and retains its full height of 1500 or 2000 feet above its base, to the southward of the Cumbrecito, or from *e* towards *a*, map, fig. 642, p. 494. In this prolongation of the cliff for half a mile southward beds of volcanic matter and dikes are seen, as in the walls of the Caldera.

The indentation forming the pass of the Cumbrecito, *e*, p. 497, has more the appearance of an old channel, such as a current of water may have excavated, than of a rent or a chasm caused by a fault. In case of a fault the lower formation would not be persistent and uninterrupted across the Cumbrecito, constituting the watershed; but would have sunk down and have been replaced by the upper basaltic rocks. If

\* Geolog. Observ., South America, p. 48.