

which have been washed away from all their other sides. Every larger stone in a water-course, after the torrent fed by a thunder-shower has just subsided, shows, on the same principle, its trail of sand and shingle piled up behind it,—sand and shingle which it kept from being swept away ; and the simple effect, when it occurs on the large scale, is known to the geologist as the phenomenon of ‘Crag and Tail.’ The rock upon which Edinburgh Castle stands, existing as the ‘*crag*,’ and the sloping ridge which extends from the castle’s outer moat to Holyrood, existing as the *tail*, may be cited as a familiar instance. We find the same phenomenon repeated in the Calton Hill, and in various other eminences in the neighbourhood ; as also in the Castle Hill of Stirling. And in all these, and many other cases, the *tail* which the *crag* protected is turned towards the east, indicating that the current which in the lapse of ages scooped out the valleys at the sides of the protecting crags, and in many instances formed, by its eddies, hollows in advance of them, just as we find hollows in advance of the larger stones of the water-course of my illustration, was a current which flowed from the west. The testimony of the ice-grooved rocks, and of the eminences composed of *crag* and *tail*, bear, we see, in the same line.

Now, this westerly direction of the current seems to be exactly that which, reasoning from the permanent phenomena of nature, might be premised. There must have been trade winds in every period of the world’s history, in which the earth revolved from west to east on its axis ; and with trade winds the accompanying drift current. And, of consequence, ever since the existence of a great western continent, stretching far from south to north, there must have been also a gulf stream. The waters heaped up against the coasts of this western continent at the equator by the drift current ever flowing westwards, must have been always, as now, returning eastwards in the temperate zone,