

the gravel. In one case an intermediate shelf appears for a short distance (three quarters of a mile) on the face of the mountain called Tombhran, between the two upper shelves, and is seen nowhere else. It occurs where there was the longest space of open water, and where, perhaps, the waves acquired a greater than ordinary power in heaping up detritus.

Next as to the precise horizontality of level maintained by the parallel roads of Lochaber over an area many leagues in length and breadth, this is a difficulty common in some degree to all the rival hypotheses, whether of lakes or glaciers, or of the simple upheaval of the land above the sea. For we cannot suppose the roads to be more ancient than the glacial period, or the era of the boulder formation of Scotland, of which I shall speak in the eleventh and twelfth chapters. Strata of that era of marine origin containing northern shells of existing species have been found at various heights in Scotland, some on the east and others on the west coast, from 20 to 400 feet high; and in one region in Lanarkshire not less than 524 feet above high-water mark. It seems, therefore, in the highest degree improbable that Glen Roy should have escaped entirely the upward movement experienced in so many surrounding regions,—a movement implied by the position of these marine deposits, in which the shells are almost all of known recent species. But if the motion has really extended to Glen Roy and the contiguous glens, it must have uplifted them bodily, without in the slightest degree affecting their horizontality; and this being admitted, the principal objection to the theory of marine beaches, founded on the uniformity of upheaval, is removed, or is at least common to every theory hitherto proposed.

To assume that the ocean has gone down from the level of the uppermost shelf, or 1250 feet, simultaneously all over the globe, while the land remained unmoved, is a view which will find favor with very few geologists, for the reasons explained in the fifth chapter.

The student will perceive, from the above sketch of the controversy respecting the formation of these curious shelves, that this problem, like many others in geology, is as yet only solved in part; and that a larger number of facts must be collected and reasoned upon before the question can be finally settled.

CHAPTER VIII.

CHRONOLOGICAL CLASSIFICATION OF ROCKS.

Aqueous, plutonic, volcanic, and metamorphic rocks, considered chronologically—*Lehman's division into primitive and secondary*—*Werner's addition of a transition class*—*Neptunian theory*—*Hutton on igneous origin of granite*—*How the name of primary was still retained for granite*—*The term "transition," why faulty*—*The adherence to the old chronological nomenclature retarded the progress of geology*—*New hypothesis intended to reconcile the igneous origin of granite to the notion of its high antiquity*—*Explanation of the chronological nomenclature adopted in this work, so far as regards primary, secondary, and tertiary periods.*