

they form mighty strata, which have been tilted out of the horizontal position, into an inclination of 15 or 20 degrees from the horizon.

The Catskills, are conspicuous monuments of geological revolutions. Not only at the base, but at the summit, from two to four thousand feet above the level of the Hudson river, we find these mountains composed extensively of fragmentary rocks, rounded and angular, and their rude piles inform us, that the materials of which they are built were once loose and rolling about, in the waves of an early ocean, encountering friction and violence in their various modes of action, and we see not how to avoid the conclusion that these mountains, after consolidation, have been raised from the depths of the sea.

Origin.

If we enquire whence arose the mighty masses of ruins of every shape and variety, composing not merely accidental fragments, or here or there a stratum or a hill, but covering myriads of square miles, which are sometimes the basis of countries, and rise occasionally even into high mountains, we must look for an adequate cause.

Such are the effects and proofs of crystallization, as exhibited in the early primitive rocks, that the contrast afforded by the fragmentary rocks, must appear very striking; and connected with their relative position, can leave no doubt on the mind, that they arose from a subsequent and totally different state of things.

What were the causes that broke up portions of the primitive rocks and left their ruins the sport of the waves, destined in the progress of time, to be cemented again into firm masses?

Besides the wearing effects of the weather and the seasons, powers still constantly in action, and of the vicissitudes of temperature, we can add the convulsions of earthquake, tempest, flood and fire, by which our planet is still occasionally agitated. Beyond these, facts do not enable us to go, but the causes that have been named would in the course of ages, perform the work, great as the results may now appear.

The breaking up of primitive and other rocks by violent convulsions, and the transportation of their ruins, often to distant places: the frequently rounded form of the fragments, presenting pebbles of every size, from that of a pea, to that of a hen's egg,—a human head, or a barrel,—quartz being not unfrequently the material; the reconsolidation of these masses into firm rocks,—their stratification at first horizontal and then rising, at various angles of inclination; the alternation of such strata with slate and coal and other deposits, their ex-