

The earliest lesson he has to learn, and that of which perhaps he will in after life meet with the most varied illustrations, is the extent to which weathering conceals the true aspect of rocks. From what has been said in previous pages, the nature of some of the alterations will be understood, and further information regarding the chemical processes at work will be found in Book III. The practical study of rocks in the field soon discloses the fact, that while, in some cases, the weathered crust so completely obscures the essential character of a rock that its true nature might not be suspected, in other instances, it is the weathered crust that best reveals the real structure of the mass. Spheroidal crusts of a decomposing yellow ferruginous earthy substance, for example, would hardly be identified as a compact dark basalt, yet, on penetrating within these crusts, a central core of still undecomposed basalt may not infrequently be discovered. Again, a block of limestone when broken open may present only a uniformly crystalline structure, yet if the weathered surface be examined it may show many projecting fragments of shells, polyzoa, corals, crinoids, or other organisms. The really fossiliferous nature of an apparently unfossiliferous rock may thus be revealed by weathering. Many limestones also might, from their fresh fracture, be set down as tolerably pure carbonate of lime; but from the thick crust of yellow ochre on their weathered faces are seen to be highly ferruginous. Among crystalline rocks, the weathered surface commonly throws light upon the mineral constitution of the mass, for some minerals decompose more rapidly than others, which are thus left isolated and more easily recognizable. In this manner, the existence of quartz in many felspathic rocks may be detected. Its minute blebs or crystals, which to the naked eye or lens are lost among the brilliant facets of the feldspars, stand out amid the dull clay into which these minerals are decomposed.

The depth to which weathering extends should be noted. The student must not be too confident that he has reached its limit, even when he comes to the solid, more or less hard, splintery, and apparently fresh stone. Granite sometimes decomposes into kaolin and sand to a depth of twenty or thirty feet or more. Limestones, on the other hand, have often a mere film of crust, because their substance is almost entirely dissolved and removed by rain (Book III. Part II. Section ii. § 2).

With some practice, the inspection of a weathered sur-