

modification of the primitive mica-slate of Maniquarez, containing garnets, cyanite, and rutile titanite. These insensible passages from primitive to transition strata, by clay-slate, which becomes carburetted at the same time that it presents a concordant position with mica-slate and gneiss, have also been observed several times in Europe by celebrated geologists. The existence of an independent formation of primitive slate (*urthonschiefer*), may even be doubted, that is, of a formation which is not joined below by strata containing some vestiges of monocotyledonous plants.

The small thonschiefer bed of Malpasso (in the southern chain of the littoral Cordillera, is separated from micaslate-gneiss by a co-ordinate formation of serpentine and diorite. It is divided into two shelves, of which the upper presents green steatitous slate mixed with amphibole, and the lower, dark-blue slate, extremely fissile, and traversed by numerous veins of quartz. I could discover no fragmentary stratum (*grauwacke*), nor *kieselschiefer* nor *chiastolithe*. The *kieselschiefer* belongs in those countries to a limestone formation. I have seen fine specimens of the *chiastolithe* (*macle*), which the Indians wore as amulets, and which came from the Sierra Nevada de Merida. This substance is probably found in transition-slate, for MM. Rivero and Boussingault observed rocks of clay-slate at the height of 2120 toises, in the Paramo of Mucuchies, on going from Truxillo to Merida.\*

III. FORMATION OF SERPENTINE AND DIORITE (GREENSTONE OF JUNCALITO.)—We have indicated above, a layer of granitiferous serpentine inclosed in the gneiss of Buena-vista, or perhaps superposed on that rock; we here find a real stratum of serpentine alternating with diorite, and extending from the ravine of Tucutunemo as far as Juncalito. Diorite forms the great mass of this stratum; it is of a dark-green colour, granular, with small grains, and destitute of

\* In Galicia, in Spain, I saw the thonschiefer containing *chiastholite*, alternate with *grauwacke*; but the *chiastholite* unquestionably belongs also to rocks which all geologists have hitherto called primitive rocks, to mica-schists intercalated like layers in granite, and to an independent stratum of mica-slate.