

of three or four degrees alternate with others which are inclined from 25 to 30 degrees; and the latter only strike our imagination, because we think all the slopes of mountains more steep than they really are. I may cite in support of this consideration the example of the ascent from the port of Vera Cruz to the elevated plain of Mexico. On the eastern slope of the Cordillera a road has been traced, which for ages has not been frequented except on foot, or on the backs of mules. From Encero to the small Indian village of Las Vigas, there are 7500 toises of horizontal distance; and Encero being, according to my barometric measurement, 746 toises lower than Las Vigas, the result, for the mean slope, is only an angle of $5^{\circ} 40'$.

In the note at the foot of this page will be seen the results of some experiments I have made on the difficulties arising from the declivities in mountainous countries.*

Isolated volcanoes, in the most distant regions, are very analogous in their structure. At great elevations all have considerable plains, in the middle of which arises a cone perfectly circular. Thus at Cotopaxi the plains of Sunigauicu extend beyond the farm of Pansache. The stony summit of Antisana, covered with eternal snow, forms an islet in the midst of an immense plain, the surface of which is twelve leagues square, while its height exceeds that of the peak of Teneriffe by two hundred toises. At Vesuvius,

* In places where there were at the same time slopes covered with tufted grass and loose sands, I took the following measures:—

5°, slope of a very marked inclination. In France the high roads must not exceed $4^{\circ} 46'$ by law;

15°, slope extremely steep, and which we cannot descend in a carriage;

37°, slope almost inaccessible on foot, if the ground be naked rock, or turf too thick to form steps. The body falls backwards when the tibia makes a smaller angle than 53° with the sole of the foot;

42°, the steepest slope that can be climbed on foot in a ground that is sandy, or covered with volcanic ashes.

When the slope is 44° , it is almost impossible to scale it, though the ground permits the forming of steps by thrusting in the foot. The cones of volcanoes have a medium slope from 33° to 40° . The steepest parts of these cones, either of Vesuvius, the Peak of Teneriffe, the volcano of Pichincha, or Jorullo, are from 40° to 42° . A slope of 55° is quite inaccessible. If seen from above it would be estimated at 75° .