

Another class of valleys may be seen between Vera Cruz and the edge of the table-land, by following the route of the Mexican railway from the coastal plain, just below Atoyac, to Esperanza, a town situated upon the margin of the plateau, at an elevation of 8,000 feet above the sea. The section is shown in figure 5, page 365, or on a scale less vertically exaggerated in figure 1. The valley may be considered as an



FIGURE 1.—Section between Esperanza and Atoyac, showing the descent of the valley by gradation steps, or a succession of base levels of erosion.

abrupt incision in the floor of the plateau. It is about forty miles long, although the railway has a much greater length on account of its windings. The upper four miles, forming the amphitheatre heading the valley, have a mean descent of about 600 feet per mile (although the uppermost mile represents a descent of a thousand feet). If reaches of eight or ten miles be taken, the mean slope is 150 feet per mile, except below the city of Orizaba, where the declivity is about half as great. The analysis of the slopes shows that they consist of very gently declining, or almost level, steps, with abrupt frontal margins. Often several steps coalesce so that, in places, they form one, several hundred feet in height. In such cases, the platforms are dissected by short *canyons*, such as may be seen at Atoyac, near Fortin, below Maltrata, and at other places. The *canyons* characterizing the edges of the steps, or terraces, are narrow and deep, and they are less than half a mile long, representing the small amount of work since the last elevation of the late base level of erosion.

The more or less buried valleys crossing the coastal plains of the southeastern part of the continent are frequently from two to four miles wide, at distances of 100 or 200 miles from their mouths, and from six to ten miles wide upon nearing the coast, which varies from fifteen to nearly 300 miles from the edge of the continental shelf. It has been already stated that the Mississippi valley is from forty to eighty miles wide, and that the upper terrace plain of the Grand *canyon* of the Colorado is from five to twelve miles wide, with bounding escarpments 2,000 feet high. The St. Lawrence is a partly drowned valley, seventy miles wide for the last hundred miles of its course, before reaching Anticosti Island, and about thirty miles in breadth for the next hundred