Dutton in Colorado, and of Davis in Pennsylvania, corroborated Gilbert's results. These American geologists demonstrated conclusively the backward progress of erosion during the excavation of a valley, and the definite relation that exists between the gradient of a river-bed and the excavating force of the river. Hence the base-level of valley erosion could be ascertained with great accuracy.

Following Rütimeyer's method, W. Morris Davis depicted the different stages in the development of a valley. In its juvenile stage the rushing stream furrows narrow channels with deep banks; in its mature stages the angle of declivity is less, the valleys become broad and the banks gently sloped; in the older stage the valley-bed is worn away to the base-level of denudation. Should any crust-movement locally lower the base-level, then the cycle of valley-formation begins anew. Davis then tried to determine the geological age of various eroded plains and their drainage systems.

The publications in Europe during the last two decades of the nineteenth century are in the main based upon the principles enunciated by Rütimeyer and the American writers.

A difficult problem is presented by the transverse valleys that cut across mountains, plateaux, and sometimes across several parallel chains. The theory of origin by tectonic faults seemed especially applicable in their case, and many of the best authorities at the present day support this explanation. But Medlicott, in 1865, in the *Memoirs of the Indian Geological Survey*, pointed out that not only was the central chain of the Himalayas clearly older than the lateral Pliocene chains, since the materials of the central chain had contributed to the rocks of the lateral chains, but the Himalayan river-courses had also been defined previous to the uplift of the Pliocene chains, and had successfully continued to erode their valleys along the old lines while these chains were being slowly uplifted.

J. W. Powell expresses the same idea in more precise terms in his explanation of the course of the Green River across the Uinta Range, and of the Colorado River in its deep cutting through the Arizona plateaux. In both cases the river passes from younger strata into older; and Powell's explanation of the apparent enigma is that after the river had eroded its channel rocks were uplifted at one portion of its course, but so slow was the rate of uplift that the river was enabled to