little basins and saddles. These folds are, to be sure, irregularly combined and in many places fractured and crushed into discontinuity. The overlying, more recent, still soft, level-bedded, alluvium-like material of the plains partially masks and obscures the geological structure of the underlying rocks, but is cut through in so many places as not to conceal it altogether. In spite of all the irregular crushing and the occasional concealment, many of the saddles and basins can be distinctly seen, or without great difficulty discerned, thanks to the mainly favorable circumstances.

In the Appalachian region of Pennsylvania the same influence of the geological structure upon the topography is observable on a much larger scale. The successive masses of harder and softer beds are much thicker, the whole series much stronger, stiffer and less readily yielding, and the basins and saddles much more extensive. The irregular crushing and breaking of these great folds is less in proportion to the whole, and the result is in the main an aggregation of comparatively simple regular waves, basins and saddles on a grand scale. The topography indicates those large forms in the same general way as the small ones we have been considering in the Punjab, and has been of great service in the study of the geology of Pennsylvania ever since the days of the first State Geological Survey. The varied topographical effects of the long, narrow basin-form and saddle-form were ably discussed by Lesley and H. D. Rogers forty years ago, when the subject was new to geologists. For the comparatively simple conditions of the Appalachians did not exist in most of the European regions where geological work had been done, and the outcrops of the different geological formations and their structure had been traced out more exclusively by means of their fossils, without regard to the topographical indications, that exist mainly in a less obvious degree.

The first impression was that the Pennsylvania topography had been produced by an immense flood of water, an ocean let loose, flowing over the land and carrying away vast quantities of earth and stones. In those days it was difficult to rid one's self of the idea that great geological changes were almost