

Before Mr. Lyell entered upon his journey, he had put into the hands of the printer the first volume of his "Principles of Geology, being an attempt to explain the former Changes of the Earth's Surface by reference to the Causes now in Operation." And after viewing such phenomena as we have spoken of, he, no doubt, judged that the doctrine of catastrophes of a kind entirely different from the existing course of events, would never have been generally received, if geologists had at first formed their opinions upon the Sicilian strata. The boundary separating the present from the anterior state of things crumbled away; the difference of fossil and recent species had disappeared, and, at the same time, the changes of position which marine strata had undergone, although not inferior to those of earlier geological periods, might be ascribed, it was thought, to the same kind of earthquakes as those which still agitate that region. Both the supposed proofs of catastrophic transition, the organical and the mechanical changes, failed at the same time; the one by the removal of the fact, the other by the exhibition of the cause. The powers of earthquakes, even such as they now exist, were, it was supposed, if allowed to operate for an illimitable time, adequate to produce all the mechanical effects which the strata of all ages display. And it was declared that all evidence of a beginning of the present state of the earth, or of any material alteration in the energy of the forces by which it has been modified at various epochs, was entirely wanting.

Other circumstances in the progress of geology tended the same way. Thus, in cases where there had appeared in one country a sudden and violent transition from one stratum to the next, it was found, that by tracing the formations into other countries, the chasm between them was filled up by intermediate strata; so that the passage became as gradual and gentle as any other step in the series. For example, though the conglomerates, which in some parts of England overlie the coal-measures, appear to have been produced by a complete discontinuity in the series of changes; yet in the coal-fields of Yorkshire, Durham, and Cumberland, the transition is smoothed down in such a way that the two formations pass into each other. A similar passage is observed in Central-Germany, and in Thuringia is so complete, that the coal-measures have sometimes been considered as subordinate to the *tottliegendes*.<sup>8</sup>

Upon such evidence and such arguments, the doctrine of catastro-

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<sup>8</sup> De la Beche, p. 414, *Manual*.