

entertained of the extent of past time by most of the ablest geologists, and when great revolutions of the earth's crust, and its inhabitants, were generally attributed to sudden and violent catastrophes.

While, in 1832, I argued against Lamarck's doctrine of the gradual transmutation of one species into another, I agreed with him in believing that the system of changes now in progress in the organic world would afford, when fully understood, a complete key to the interpretation of all the vicissitudes of the living creation in past ages. I contended against the doctrine, then very popular, of the sudden destruction of vast multitudes of species, and the abrupt ushering into the world of new batches of plants and animals.

I endeavoured to sketch out (and it was, I believe, the first systematic attempt to accomplish such a task) the laws which govern the extinction of species, with a view of showing that the slow, but ceaseless variations, now in progress in physical geography, together with the migration of plants and animals into new regions, must, in the course of ages, give rise to the occasional loss of some of them, and eventually cause an entire fauna and flora to die out; also, that we must infer, from geological data, that the places thus left vacant from time to time, are filled up without delay by new forms, adapted to new conditions, sometimes by immigration from adjoining provinces, sometimes by new creations. Among the many causes of extinction enumerated by me, were the power of hostile species, diminution of food, mutations in climate, the conversion of land into sea, and of sea into land, &c. I firmly opposed Brocchi's hypothesis, of a decline in the vital energy of each species;* maintaining that there was every reason to believe that the reproductive powers of the last surviving representatives of a species were as

* Principles of Geology, 1st ed. vol. ii. ch. viii.; and 9th ed. p. 668.