

direct excavation, must have remained for ever unknown to him. Now, man has very seldom penetrated the rocks below the depth of half a mile, and rarely so deep as that; whereas, by the elevations, dislocations, and overturnings that have been described, he obtains access to all deposits of useful substances that lie within fifteen or twenty miles of the surface; and many are thus probably brought to light from a greater depth. He is indebted, then, to this disturbing agency for nearly all the useful metals, coal, rock-salt, marble, gypsum, and other useful minerals; and when we consider how necessary these substances are to civilized society, who will doubt that it was a striking act of benevolence which thus introduced disturbance, dislocation, and apparent ruin into the earth's crust?

Another decided advantage resulting from this disturbing agency is the formation of valleys.

If we suppose the strata spread uniformly over the earth's entire surface, then the ocean must envelop the whole globe. But, admitting such interruptions in the strata to exist as would leave cavities, where the waters might be gathered together into one place, and the dry land appear, still that dry land must form only an unbroken level. Streams of water could not exist on such a continent, because they depend upon inequalities of surface; and whatever water existed must have formed only stagnant ponds, and the morasses which would be the consequence would load the air with miasms fatal to life; so that we may safely pronounce the world uninhabitable by natures adapted to the present earth. But such, essentially, must have been the state of things, had not internal forces elevated and fractured the earth's crust. For that was the origin of most of our valleys; of all the larger valleys, indeed, which checker the surface of primary countries. Most of them have been modified by subsequent agencies; but their leading features, their outlines, have been the result of those internal disturbances which spread desolation over the surface. We are apt to look upon such an agency as an exhibition of retributive justice, rather than of benevolence. And yet that admirable system for the circulation of water, whereby the rain that falls upon the surface is conveyed to the ocean, whence it is returned by evaporation, depends upon it. It imparts, to all organic nature, life, health, and activity; and had it not thus ridged