

BOOK III

DYNAMICAL GEOLOGY, 324

PART I.—HYPOGENE ACTION: AN INQUIRY INTO THE GEOLOGICAL CHANGES IN PROGRESS BENEATH THE SURFACE OF THE EARTH, 326

I. VOLCANOES AND VOLCANIC ACTION

1. Volcanic Products 327

1. Gases and Vapors, 330—2. Water, 336—3. Lava, 338—4. Fragmentary Materials, 340.

2. Volcanic Action 344

Active, Dormant, and Extinct Phases, 344—Sites of Volcanic Action, 346—Ordinary Phase of an Active Volcano, 349—Conditions of Eruption, 349—Periodicity of Eruptions, 352—General Sequence of Events in an Eruption, 354—Fissures, 355—Explosions, 360—Showers of Dust and Stones, 363—Lava-streams, 370—Elevation and Subsidence, 395—Torrents of Water and Mud, 396—Effects of the closing of a Volcanic Chimney—Sills and Dikes, 398—Exhalations of Vapors and Gases, 399—Geysers, 402—Mud-Volcanoes, 407.

3. Structure of Volcanoes 409

i. Volcanic Cones, 409—Submarine Volcanoes, and Volcanic Islands, 424—ii. Fissure (Massive) Eruptions, 432.

4. Geographical and Geological Distribution of Volcanoes . . . 439

5. Causes of Volcanic Action 447

II. EARTHQUAKES 459

Amplitude of Earth-Movements, 461—Velocity, 461—Duration, 463—Modifying Influence of Geological Structure, 463—Extent of Country affected, 466—Depth of Source, 466—Geological Effects, 468—Distribution, 473—Origin, 474.

III. SECULAR UPHEAVAL AND DEPRESSION 478

Upheaval, 482—Subsidence, 489—Causes of Upheaval and Depression of Land, 494.