

tories since 1828; a far-extending net-work of magnetic stations—p. 190 and note. Development of light at the magnetic poles; terrestrial light as a consequence of the electro-magnetic activity of our planet. Elevation of polar light. Whether magnetic storms are accompanied by noise. Connection of polar light (an electro-magnetic development of light) with the formation of cirrus clouds. Other examples of the generation of terrestrial light—p. 202 and note.

*b.* The vital activity of a planet manifested from within outward, the principal source of geognostic phenomena. Connection between merely dynamic concussions or the upheaval of whole portions of the earth's crust, accompanied by the effusion of matter, and the generation of gaseous and liquid fluids, of hot mud and fused earths, which solidify into rocks. Volcanic action, in the most general conception of the idea, is the reaction of the interior of a planet on its outer surface. Earthquakes. Extent of the circles of commotion and their gradual increase. Whether there exists any connection between the changes in terrestrial magnetism and the processes of the atmosphere. Noises, subterranean thunder without any perceptible concussion. The rocks which modify the propagation of the waves of concussion. Upheavals; eruption of water, hot steam, mud mofettes, smoke, and flame during an earthquake—p. 202-218 and notes.

*c.* Closer consideration of material products as a consequence of internal planetary activity. There rise from the depths of the earth, through fissures and cones of eruption, various gases, liquid fluids (pure or acidulated), mud, and molten earths. Volcanoes are a species of intermittent spring. Temperature of thermal springs; their constancy and change. Depth of the foci—p. 219-224 and notes. Salses, mud volcanoes. While fire-emitting mountains, being sources of molten earths, produce volcanic rocks, spring water forms, by precipitation, strata of limestone. Continued generation of sedimentary rocks—p. 228 and note.

*d.* Diversity of volcanic elevations. Dome-like closed trachytic mountains. Actual volcanoes which are formed from craters of elevation or among the detritus of their original structure. Permanent connection of the interior of our earth with the atmosphere. Relation to certain rocks. Influence of the relations of height on the frequency of the eruptions. Height of the cone of cinders. Characteristics of those volcanoes which rise above the snow-line. Columns of ashes and fire. Volcanic storm during the eruption. Mineral composition of lavas—p. 236 and notes. Distribution of volcanoes on the earth's surface; central and linear volcanoes; insular and littoral volcanoes. Distance of volcanoes from the sea-coast. Extinction of volcanic forces—p. 246 and notes.

*e.* Relation of volcanoes to the character of rocks. Volcanic forces form new rocks, and metamorphose the more ancient ones. The study of these relations leads, by a double course, to the mineral portion of geognosy (the study of the textures and of the position of the earth's strata), and to the configuration of continents and insular groups elevated above the level of the sea (the study of the geographical form and outlines of the different parts of the earth). Classification of rocks according to the scale of the phenomena of structure and metamorphosis, which are still passing before our eyes. Rocks of eruption, sedimentary rocks, changed (metamorphosed) rocks, conglomerates—compound rocks are definite associations of oryctognostically simple fossils. There are four phases in the formative condition: rocks of eruption,