appear most conspicuously in the air of towns. The organic substances present in the air are sometimes living germs, such as probably often lead to the propagation of disease, and sometimes mere fine particles of dust derived from the bodies of living or dead organisms.[5]

As a geological agent, the atmosphere effects changes by the chemical reactions of its constituent gases and vapors, by its varying temperature, and by its motions. Its functions in these respects are described in Book III. Part. II. Section i.

2. **The Oceans.**—Rather less than three-fourths of the surface of the globe (or about 144,712,000 square miles) are covered by the irregular sheet of water known as the Sea. Within the last twenty years, much new light has been thrown upon the depths, temperatures, and biological conditions of the ocean-basins, more particularly by the "Lightning," "Porcupine," "Challenger," "Tuscarora," "Blake," "Gazelle" and other expeditions fitted out by the British, American, German and Norwegian Governments.[6] It has been ascertained that few parts of the Atlantic Ocean exceed 3000 fathoms, the deepest sounding obtained there being one taken about 100 miles north from the island of St. Thomas, which gave 3875 fathoms, or rather less than 4½ miles. The Atlantic appears to have an average depth

[5] The air of towns is peculiarly rich in impurities, especially in manufacturing districts, where much coal is used. These impurities, however, though of serious consequence to the towns in a sanitary point of view, do not sensibly affect the general atmosphere, seeing that they are probably in great measure taken out of the air by rain, even in the districts which produce them. They possess, nevertheless, a special geological significance, and in this respect, too, have important economic bearings. See on this whole subject, Angus Smith's "Air and Rain," and the account of Rain in Book III. Part II. Sect. ii.

[6] See Wyville Thomson, "The Depths of the Sea," 1873; "The Atlantic," 1877; "Report of 'Challenger' Expedition," especially the forthcoming volumes giving a summary of results; A. Agassiz, "Three Cruises of the 'Blake,'" 1888; "Den Norske Nordhavs-Expedition," 1876–78.