calcareous matter of corals is sometimes replaced by hornblende, garnet, and axinite, without deformation of the fossils. 60

Since experiment has proved that in presence of water under pressure, even at comparatively low temperatures, mineral substances are vigorously attacked (p. 521), we may expect to find that as these conditions abundantly exist within the earth's crust, the rocks exposed to them have been more or less altered. A large proportion of the accessible crust consists of sedimentary materials which were laid down on the ocean-bottom, and which were still abundantly soaked with sea-water even after they had been covered over with more recent formations. The gradual growth of submarine accumulations would of course deprive the lower strata of most of their original water, but some proportion of it would probably remain. If, according to Dana, the average amount of interstitial water in stratified rocks, at the earth's surface, such as limestones, sandstones and shales, be assumed to be 2.67 per cent, which is probably less than the truth, "the amount will correspond to two quarts of water for every cubic foot of rock." 57 There is certainly a considerable store of water ready for chemical action when the required conditions of heat and pressure are obtained. We must also remember that the water in which the sedimentary formations of the crust were formed, being mostly that of the ocean, already possessed chlorides, sulphates, and other salts with which to begin its reactions. The inference may therefore be drawn, that rocks possess-

<sup>&</sup>lt;sup>54</sup> Ann. des Mines, 5me ser. xii. p. 318. H. H. Reusch, "Die Fossilien führenden krystallinischen Schiefer von Bergen" (translated by R. Baldauf), Leipzig, 1883. <sup>57</sup> "Manual," 3d ed. 1880, p. 758