nearly pure crumbling gypsum to be about 230 feet (70 metres) deep.[212]

The desiccated floors of the great saline lakes of Utah and Nevada have revealed some interesting facts in the history of saliferous deposits. The ancient terraces marking former levels of these lakes are cemented by tufa, which appears to have been abundantly formed along the shores where the brooks, on mingling with the lake, immediately parted with their lime. Even at present, oolitic grains of carbonate of lime are to be found in course of formation along the margin of Great Salt Lake, though carbonate of lime has not been detected in the water of the lake, being at once precipitated in the saline solution. The site of the ancient salt lake which has been termed Lake Lahontan displays areas several square miles in extent covered with deposits of calcareous tufa, 20 to 60 and even 150 feet thick. This tufa, however, presents a remarkable peculiarity. It is sometimes almost wholly composed of what have been determined to be calcareous pseudomorphs after gaylussite (a mineral composed of carbonates of calcium and sodium with water)—the sodium of the mineral having been replaced by calcium. When this variety of tufa, distinguished by the name of *thïnolite*, was originally formed, the waters of the vast lake must have been bitter, like those of the little soda-lakes which now lie on its site—a dense solution in which carbonate of soda predominated. On the margin of one of the present Soda Lakes, crystals of gaylussite now form in the drier season of the year. Yet no trace of carbonate of lime has been detected in the water. The carbonate of lime in the crystals must be derived from water which on entering the saline lakes is at once deprived of its lime.[213]

§ 5. Terrestrial Ice

Fresh water, under ordinary circumstances, when it reaches a temperature of 32° Fahr. passes into the solid state by crystallizing into ice. In this condition, it per-

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[212] Lesseps, Comptes Rend. lxxviii. p. 1740, Ann. Chim. et Phys. (5), iii. p. 139. Bader, Verh. Geol. Reichsanst. 1869, p. 288.

[213] King, Exploration of the 40th Parallel, i. p. 510. See also on the crystallographic form and chemical composition of the thinolite and its original mineral, E. S. Dana, Bull. U. S. Geol. Surv. No. 12, 1884.