The humus acids, which possess the power of dissolving silica, precipitate it in incrustations and concretions. Julien describes hyalite crusts at the Palisades of the Hudson, due, as he thinks, to the action of the rich humus upon the fallen débris of diabase. The frequent occurrence of nodules of flint and chert in association with organic remains, the common silicification of fossil wood, and similar close relations between silica and organic remains, point to the action of organic acids in the precipitation of this mineral. This action may consist sometimes in the neutralization, by organic acids, of alkaline solutions charged with silica;[361] sometimes in the solution and redeposit of colloid silica by albuminoid compounds, developed during the decomposition of organic matter in deposits through which silica has been disseminated, the deposit taking place preferentially round some decaying organism, or in the hollow left by its removal.[362]

Animals.—Animal formations are chiefly composed of the remains of the lower grades of the animal kingdom, especially of *Mollusca*, *Actinozoa*, and *Foraminifera*.

1. Calcareous.—Lime, chiefly in the form of carbonate, is the mineral substance of which the solid parts of invertebrate animals are mainly built up. The proportion of carbonate of lime in sea-water is so small as to have presented a difficulty in the endeavor to account for the vast quantities of this substance eliminated by marine organisms. Mr. J. Y. Buchanan, however, has suggested that the testaceous denizens of the sea assimilate their lime from the gypsum dissolved in sea-water, forming sulphide in the

[361] Leconte, Amer. Journ. Sci. 1880, p. 181.

[362] Julien, op. cit. 396. Sollas, Ann. Mag. Nat. Hist. Nov. Dec. 1880. J. Roth, "Allgem. Chem. Geologie," p. 576, and Dr. von Ollech's pamphlet cited ante, p. 802.